EFFICACY OF INTEGRATED YOGA PRACTICES ON HEALTHY PEOPLE USING ELECTRO PHOTONIC IMAGING TECHNIQUE

Thesis submitted by

Kuldeep Kumar Kushwah

Towards the partial fulfilment of

DOCTOR OF PHILOSOPHY (YOGA)

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By

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I also declare that the subject matter of my thesis entitled EFFICACY OF INTEGRATED YOGA PRACTICES ON HEALTHY PEOPLE USING ELECTRO PHOTONIC IMAGING TECHNIQUE has not previously formed the basis of the award of any degree, diploma, associate-ship, fellowship or similar titles.

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STANDARD INTERNATIONAL TRANSLITERATION CODE USED TO TRANSLITERATE SANSKRIT WORDS

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

ABSTRACT

INTRODUCTION

Yoga based techniques are extensively used as a lifestyle strategy for both prevention and management of various ailments across India/world. Energy homeostasis is the key essence of a healthy life. Investigation of the energy homeostasis accomplished through integrated yoga practices is needed.

Electro photonic imaging (EPI) technique is growing as a novel technique of health assessment. It is being utilized in the fields of alternative medicine, conventional medicine, psycho-physiology, psychology and consciousness studies. The existing EPI norms are mostly based on European population. In order to enhance practice and research through EPI in India, there is a need for developing EPI norms for the healthy Indian population.

LITERARY REVIEW

In the literary review, the references of *Prāṇa* and *Prāṇamaya kośa* have been drawn to support a theoretical model which explains the dynamic nature of Prāṇa in living beings. This model includes supportive evidence from the experiments conducted in the present study.

In the scientific literature review, four domains of scientific studies were reviewed 1) Various studies conducted to find out EPI patterns in various populations mostly in clinical area, 2) Studies investigating effect of yoga, meditation and some healing techniques through EPI/GDV, 3) Cyclic Meditation investigations, and 4) Studies through Integrated Yoga Module.

Findings revealed that there is a need to develop EPI norms for healthy Indian population and also a need for an objective instrument to study the effect of yoga based interventions on bio-energy dimensions.

AIM

The aim of the study is to investigate the effect of Integrated Yoga Practices on Healthy volunteers using Electro Photonic Imaging (EPI).

OBJECTIVES

The objectives of this study are four fold: a) to explore the relation between EPI and *Prāṇamaya kośa,* b) to develop normative data of EPI for healthy Indian population, c) to investigate the effect of Cyclic Meditation on stress and health indices in managers using EPI and, d) to explore the effect of a four week Integrated Yoga Module (IYM) on stress, general health index and disorderliness (in the human energy system) in healthy population, using EPI.

METHODS

Study 1) *Prāṇamaya Kośa* Study

To carry out the experiments, healthy live leaves in a flower pot and dry dead leaves were chosen. We used four different species of plants for the experiments.

Study 2) Normative Data Study

A total of 1297 volunteers from different parts of India were assessed once, spread over 12 months. Among them, 880 volunteers were reported to be healthy (age Mean±SD, 33.55±10.92), with 584 males (age Mean±SD, 33.54±10.86) and 296 females (age Mean±SD, 33.56±11.00).

Study 3) Cyclic Meditation VS Supine Rest Study

EPI technique was used to assess subjects before and after 35 min of Cyclic Meditation (CM) and equal duration of supine rest (SR) sessions. A total of 66 male managers (CM = 33and SR = 33), age ranging from 35 to 60 years (mean ± standard deviation 53.97 ±5.96 years), were included in the study.

Study-4) Integrated Yoga Module (IYM)

94 healthy volunteers (male 55 and female 39, age Mean±SD 26.70±8.58) were assessed before and after four weeks of an IYM, utilizing the Electro Photonic Imaging (EPI) technique.

Activation Coefficient (stress level), Integral Area (general health) and Integral Entropy (disorderliness) parameters were analysed in studies 2-4.

DESIGN

Study-1

1. Whole leaf versus cut leaf videos

2. Live leaf versus dead leaf and dead wet leaf videos

Study-2

A survey design was adopted for the second project

Study-3

Two-group comparative design

Study-4

A **s**ingle arm prospective study

ASSESSMENT TOOLS

In the present study, EPI Pro and EPI Compact devices produced by Kirlionics Technologies International, Saint-Petersburg, Russia were used for the assessments.

DATA EXTRACTION

EPI/GDV Diagram Software Program was used for data extraction. This provides EPI parameters, viz; Activation Coefficient, Integral Area and Integral Entropy.

DATA ANALYSIS

Data analysis was carried out using R statistical package.

RESULTS

Study 1) Observations showed, the Phantom Leaf Effect (PLE) occurs mostly due to moisture. When measured with various time intervals, the results demonstrated that live leaves have high and dynamic Electro Photonic (EP) emission, wet dead leaves have low and constant EP emission and dry dead leaves have no EP emission.

Study 2) As the data were not normally distributed, quartile based statistics was used for setting the norms. The 25^{th} and 75^{th}percentiles were calculated and they were further verified using bootstrap procedure. Uniquely, the results showed a clear difference in integral area parameters under both with-filter (physiological) and without-filter (psycho-physiological) conditions among the Indian and the European population.

Study 3) CM produced a highly significant reduction in stress level, whereas this reduction was not found in SR group. There was a significant improvement in health index, (IA values), both left and right sides within the CM group while only IA in right side showed a significant improvement within the SR group. The IE value on the right side decreased significantly within the CM group, whereas IE on the left deteriorated within the SR group. In addition, only IE on left side has shown a significant difference between the groups.

Study 4) Decrease in stress, increase in general health and decrease in left entropy parameters were found reproducible in all four experiments. The results also revealed a highly significant reduction in stress levels and highly significant improvement in health indices at the psycho-physiological level.

CONCLUSION

Anticipated phantom leaf effect was not reproduced and mostly it seems to be just a moisture effect. Some of the EPI norms for Indian population were found different from European norms. Both CM and IYM interventions have demonstrated effectiveness in reducing stress level and improvement in health indices.

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CHAPTER – 1.0

INTRODUCTION

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1.0 INTRODUCTION

1.1 HEALTH

Health and its care have become a global concern. The fast pace of life, sedentary lifestyle, and immoderation in diet, activities, recreation and sleep are the factors responsible for stressful living and ultimately manifest in diseases (Bijlani et al., 2005; Sivananda, 2008a; Smaldone, Honig, & Byrne, 2007; Waxman, 2005). These are obesity, diabetes mellitus, heart diseases, hyperlipidaemia, respiratory infections and cancer (Segasothy & Phillips, 1999; Sharma & Majumdar, 2009) that affects daily work and quality of life of individuals (Van Nieuwenhuizen, Buffart, Brug, René Leemans, & Verdonck-de Leeuw, 2015). Thus, there is a need for changes in lifestyle in most populations to prevent ill health and promote good health. Since energy is the foundation of electrophysiological and biochemical processes, it is necessary to measure and correlate the energy through available technology known as electro photonic imaging technique (EPI).

1.2 YOGA

Yoga, an ancient Indian lifestyle-related discipline has been scientifically proven and shown to improve physical, mental, and emotional wellbeing (Buffart et al., 2012; Gard, Noggle, Park, Vago, & Wilson, 2014) through all its components which include *Kriyās* (cleansing techniques), *Āsana* (yogic postures), *Prāṇāyāma* (breathing practices), meditation and diet. These techniques correct energy imbalances, and restores energy homeostasis in humans (Lynton, Kligler, & Shiflett, 2007). This energy is known as *Prāṇa* (Srinivasan, 2014) *and* is considered to be the vital energy that regulates all cellular processes and keeps a person healthy. Also, per *Āyurvedic* texts, *Prāṇa* (Traditional Chinese Medicine counterpart, Qi) is believed to be responsible for health of every cell in the body (Sancier & Hu, 1991). Availability of cellular electrons is closely related to the health of cells in the body (Szent-Gyorgyi, 1978). *Prāṇa*, the fundamental fabric of subtle energy on the one side, and electrons, the fundamental aspect of matter on the other side, we conceptually related both of them and expect that both will converge closely. Through this, we derive our operational definitions of various abstract constructs. The conceptual relationship between *Prāṇa* and electrons seems to be quite evident, however, more empirical evidence is needed to support the conceptual idea. We operationally define *Prāṇa* as the intensity of electro photonic emission patterns as obtained in a form of EPI-gram. Homeostasis of *Prāṇa* is operationally defined as uniformity of electro photonic emission patterns in a form of EPI-gram as obtained by EPI instrument. Electron availability is operationally defined as the intensity of electro photonic patterns obtained from EPI-grams.

Further, when the homeostasis level of *Prāṇa* is lost, it leads to pain and somatic diseases as postulated in yoga (Srinivasan, 2013, 2014). All the animate beings require steady conditions inside for their survival, such as internal temperature, body pH, metabolic rate and energy expenditure versus energy consumption; similarly, energy (*Prāṇa*) homeostasis is required for healthy functioning of all systems within the body.

The health and disease concept of yoga enables us to better understand the root cause of diseases and disorders (*Vyādhi*) which are believed to emerge from the disrupted mind (leading to *Ādhi*) and beyond. The disturbed mind leads to stress and further creates imbalances in *Prāṇa* and later, these imbalances in *Prāṇa* manifest as a disease or disorder at the physical level (Nagarathna & Nagendra, 2009), especially in those systems and organs which have either deficient or disturbed *Prāṇa*. This understanding of disease manifestation suggests that if this hindrance in *Prāṇa* energy could be prevented or corrected, then we could probably succeed in preventing diseases and also reverse the progress of manifested diseases.

Earlier research on short-term lifestyle modification and stress management education program based on Yoga has shown remarkable improvement in subjective well-being scores of the subjects (Sharma, Gupta, & Bijlani, 2008). This could therefore make a considerable contribution to early prevention as well as management of lifestyle diseases. The present evidence convinced us to attempt research on "yoga based lifestyle-related program in healthy subjects to prevent ill health and promote health" observing the energy trend, improvement in energy patterns and reproducible results.

1.3 CYCLIC MEDITATION

Cyclic meditation (CM) is a yoga based relaxation method. The foundation for CM is from *Māṇḍūkya Upaniṣat* (An, Kulkarni, Nagarathna, & Nagendra, 2010). The verse emphasizes that the human mind is either in agitation or in drowsy states; with this in focus, the CM concept was developed. CM practice is to stimulate the mind when it is drowsy and to pacify the mind in case of agitation and to maintain the settled mind in perfect equilibrium (Lokeswarananda, 2005). These two cyclical phases of the mind can be altered at one's own will. Studies have found that the asana phase of the CM is associated with sympathetic activation, whereas relaxation phase is associated with parasympathetic activation (Sarang & Telles, 2006). Many of the meditation practices yield a relaxation response, whereas the moving meditation practice that combines a practice of *Āsana* (yoga postures) and guided relaxation known as CM has been found more effective in reducing physiological arousal in comparison with supine rest (SR) (Sarang & Telles, 2006; Subramanya & Telles, 2009a). The effect of CM has been studied using various tools, both objectively and subjectively. The documented findings show that CM reduces occupational stress, autonomic arousal, anxiety, oxygen consumption, P300 peak latency, improves memory, attention, sleep and quality of life (Subramanya & Telles, 2009a). CM is an efficient relaxation technique that provides immediate effect and may be carried out *on the spot* for achieving a quick relaxation response.

In the present study, we have proposed to compare the effect of CM practice with an equal duration of SR (*Śavāsana*). It is evident that the CM practice reduces autonomic arousal, and the EPI technique measures autonomic functions; however, there is no such study which applies EPI technique to study the effect of CM. Thus, the current experiment is aimed at investigating the effect of CM on stress and health indices using EPI technique. It may also provide evidence to measure the relaxation response using this procedure.

1.4 ELECTRO PHOTONIC IMAGING (EPI)

Electro Photonic Imaging (EPI) is a novel technique growing in its application in the field of scientific instrumentation to assess health status on the basis of bio-energy. Because of its versatile applications and unique features, a number of research publications applying EPI technique can be found (Pavel, Bundzen, Korotkov, & Unestahl, 2002; Ciesielska, Szadkowska, Masajtis, & Goch, 2010; Drozdovski, Gromova, Korotkov, Shelkov, & Akinnagbe, 2012; Guru Deo, Itagi, Srinivasan, & Kuldeep, 2015; Hacker et al., 2005; Korotkov & Popechitelev, 2002; Korotkov & Korotkin, 2001; Korotkov et al., 2012; Korotkov, Bundzen, Bronnikov, & Lognikova, 2005; Korotkov, Matravers, Orlov, & Williams, 2010; Korotkov, Williams, & Wisneski, 2004; Kostyuk, Cole, Meghanathan, Isokpehi, & Cohly, 2011; Kostyuk, Rajnarayanan, Isokpehi, & Cohly, 2010; Lee, Khong, & Ghista, 2005). It is a quick, non-invasive, simple, painless, inexpensive method of assessment, with high level of reliability (Korotkov et al., 2012, 2010, 2004). Therefore, the application of EPI is increasing worldwide and becoming popular in various fields such as conventional practices, alternative medicine, psycho-physiologic practice, psychology, consciousness studies, sports and material testing and it is being utilized in more than 62 countries worldwide. In the field of medicine, EPI had been employed to study diabetes mellitus, cardiovascular diseases, hypertension, autism, asthma, cancer and many more diseases (Korotkov et al., 2010; Kostyuk et al., 2010; Sharma, Hankey, & Nagendra, 2014).

1.5 EPI TECHNIQUE

Electro photonic imaging (EPI) technique also known as the gas discharge visualization (GDV), based on Kirlian effect has been used as a scientific method to assess stress and health in individuals (Korotkov et al., 2012, 2010). The assessment by EPI is performed through stimulation of electrons at the fingertips by applying a short electric pulse of a high voltage (10 kV), high frequency (HF) (1024 Hz) and low current for less than a millisecond; (Hacker et al., 2005); then a glow occurs around the finger pads. This glow is the consequence of ionization of gaseous molecules in the surrounding air through the discharged electrons from the fingertips and known as electro photonic emission. This glow emission is captured by a charge-coupled device camera that is situated under a dielectric glass plate in EPI system (Korotkov et al., 2004). These images are obtained from all 10 fingertips of both hands, and further they are divided into various sectors corresponding to various organ systems. These image pixels are further processed using image processing software, and various parameters are extracted using algorithms to bring further meaningful information. It is also empirically evaluated that various image sectors have connections with diverse organs and systems in the body (Hacker et al., 2005; Korotkov, 2011a; Korotkov et al., 2012). In addition, these sector correlations of organs in the body are supported by the acupuncture and meridian theory of Sujok (Korotkov, 2002a). Further, a scientific report on a newly found circulatory system within the body called Bonghan system also adds evidence in favour of these connections with the diverse organs. Bonghan system is a thread-like structure; it is situated superficially, inside the blood or lymph vessels, on the surface of internal organs, and also in the brain ventricles (Soh, 2009). This provides a potential link between the EPI sectors from finger images and the organ systems of the body.

This thesis work presents four different but interlinked projects. The very first one was to test the availability of *Prāṇa* in live and dead leaves. Second project was undertaken to develop EPI norms for healthy Indian subjects to enable the studies in various areas of conventional medicine, alternative medicine, psycho-physiologic practice, psychology and consciousness studies. Third project was designed to measure the effect of cyclic meditation on stress and health indices in managers using EPI technique. And the fourth project was to assess the sustainability of energy levels and improvement in disturbances in energy patterns; and reproducibility of the results was also examined (through 4 batches of recruits) with integrated yoga module as an intervention in healthy Indian people.

CHAPTER – 2.0

LITERARY SEARCH

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2.0 LITERARY SEARCH

2.1 REVIEW OF WORK DONE EARLIER IN THE FIELD

Many studies have been carried out exploring the concept of *Prāṇa* and *Prāṇamaya kośa*, *Cakrās* and *Nāḍīs* and their relevance with the health and diseases. Here, we present some of the recent studies that are relevant to our present literary work.

In a M.Sc. dissertation, entitled "Effect of integrated yoga lifestyle module on Acugraph measures, has detailed the both *Prāṇa* and Chi, *Prāṇa* from various ancient Indian scriptures (*Vedās*, *Upaniṣad*, and *Śrīmadbhagavadgītā*) and Chi from ancient Chinese scriptures. An attempt have been made in order to correlate *Prāṇa* and chi, *Iḍā* and *Piṅgalā Nāḍīs* with Yin and Yang. And author also focused on the presence of Chi energy that is responsible for health (Niharika, 2012).

In a master dissertation, concept of *Prāṇa*, its evolution and its regulation through *Prāṇāyāma* have been brought out to demonstrate the role of *Prāṇāyāma* (yogic breathing) in improving the endurance and performance of competitive swimmers. In this work, *Upanishads* – *Praśnopaniṣat, Taittirīyopaniṣat* and yoga texts *Pātañjalayogasūtrāṇi*, *Haṭhayogapradīpikā*, *Śrīmadbhagavadgītā* and *Yogavāsiṣṭhaḥ* have been referred. The author have highlighted the evolution of *Prāṇa* from ancient scripture, its relevance with breathing, its regulation through *Prāṇāyāma* and also mentioned how to achieve mastery over *Prāṇa* through *Prāṇāyāma* (Hakked, 2013).

In a Ph.D. thesis, entitled, “understanding type 2 diabetes at the *Prāṇamaya Kośa* level” have focused on the *Prāṇic* energy imbalances when increase, so do the grounds for manifestation of pathology and tracking the *Prāṇa* imbalances caused by emotions and other blockages (*Ādhi*) in apparently healthy patients forms a potentially important aspect of disease prevention. This work attempted to introduce new methodology and new techniques of assessments (GDV/EPI and Acugraph) to get help in reversing the imbalances before pathology manifests and to reduce the incidence of disease in the whole population (Sharma, 2014).

Another Ph.D. thesis, entitled, “Electro-dermal study of acupuncture meridian endpoint energies in health and various conditions including type 2 diabetes mellitus” the structure of imbalances in Prāṇa and its five components (five *vāyus*), their locations, and the mechanism by which this imbalances develop in the body were focused. In this work various scriptures were extensively reviewed and a theoretical model was proposed for *Prāṇa*/chi imbalances that leads to diseases (Meenakshy, 2015).

TABLE 1: SUMMARY TABLE OF PREVIOUS WORKS			
AUTHOR AND YEAR	**SUMMARY**	**STRENGTH**	**LIMITATIONS**
Niharika, 2012 (M.Sc. Dissertation)	1. The concept of *prāṇa* was driven from ancient scriptures (*Vedās*, *Upaniṣad*, and *Śrīmadbhagavadgītā*) and concept of Chi energy was driven from ancient Chinese scriptures. 2. Presence of Chi energy in the body was related to be responsible for sustaining health.	1. Correlation between *Prāṇa* and chi have been brought out 2. *Iḍā* and *piṅgalā nāḍīs* were related to Yin and Yang 3. Five main *Prāṇas*, sub *Prāṇas* and their functioning were mentioned 4. *Prāṇa* was defined from *vedās* point of view which gives in-depth understanding of *Prāṇa* 5. Theoretical work was related to experimental work.	1. No theoretical model Was proposed 2. Major focus have been only on *Prāṇa* and chi relevance

Hakked, 2013 (M.Sc. Dissertation)	1. Explained the concept of *Prāṇa*, its evolution and its regulation through (*Prāṇāyāma*). 2. The texts referred were *Praśnopaniṣat, taittirīyopaniṣat, Pātañjalayogasūtrāṇi, Haṭhayogapradīpikā, Śrīmadbhagavadgītā* and *Yogavāsiṣṭhaḥ*. 3. *Prāṇa* is force behind every action.	1. *Prāṇa* and breath were related 2. *Prāṇa* regulation was focused 3. Experimental work has been related with literature review 4. *Prāṇa* and *Prāṇāyāma* have been detailed	1. No theoretical model was proposed 2. Main focus of the work was on *Prāṇa* and Prāṇamaya kośa only
Sharma, 2014 (Ph.D. thesis)	Main focused on the *Prāṇic* energy imbalances which grounds for manifestation of pathology. Tracking the *Prāṇa* imbalances at earliest in apparently healthy	1. A theoretical framework for the subtle anatomy of *Prāṇamaya kośa* have been proposed	Out of 108 major and minor Upanishads mainly focused on *Prasnopaniṣad* with some input from *taittirīyopaniṣat* and *chāndogyopaniṣat*.

	patients forms a potentially important aspect of disease prevention. For this, a new methodology and new techniques of assessments have been incorporated in experimental work.	2. An attempt has been made to incorporate the literary search in experimental work 3. Various texts on yoga and Ayurveda have been presented to bring out the concept of disease.	And major focus of the work was on yoga bioenergetics and their relation to disease.

Meenakshy, 2015 (Ph.D. thesis)	Functioning of *Prāṇa* connected to respiration and circulation. Imbalance in Ojas and Tejas cause imbalance in *Prāṇa* and vice versa.	1. Detailed on *Prāṇa* imbalances caused by *Ādhi* 2. Elucidation on the structure of imbalances in *Prāṇa* and 5 *vāyus* 3. The mechanism how this *Prāṇa* imbalance develop 4. A theoretical model for *Prāṇa*/Chi imbalances leads to diseases was proposed 5. Literary search work was related to experimental work	Major focus was on *Prāṇa*/chi imbalances caused by Ādhi and the mechanism of how this imbalance develops and its relation with diseases

2.2 CONCLUSION

Most of the studies done earlier have focused on compilation of the information available in the ancient texts about *Prāṇa*, *Prāṇamaya kośa*, *nāḍīs* and *cakrās*. Some of the work have proposed theoretical framework in the support of their experimental studies; such as in a study by Sharma 2014, a theoretical framework for the subtle anatomy of *Prāṇamaya kośa* was proposed and in another study by Meenakshy 2015, a theoretical model for *Prāṇa*/Chi imbalances leads to diseases have been proposed. But, earlier studies have not explored measurement of *Prāṇa*. Hence in our study, we have attempted three things, first, to draw a concept of the *Prāṇamaya kośa*, the compilation of verses related to *Prāṇa* and *Prāṇamaya kośa* (relating to our work) from various ancient scriptures which supports our experimental work. Secondly, we have conducted an experiment on live and dead leaves to find out the dynamic presence of *Prāṇa* and lastly developed a theoretical framework.

2.3 AIM & OBJECTIVES

AIM

To understand the concept of *Prāṇā* and *Prāṇamaya kośa* in animate and inanimate subjects.

OBJECTIVES

- To present information about *Prāṇa* with its specific functions.
- To find out the availability of the life force in the animate.
- To develop a model explaining the dynamic presence of *Prāṇa* through experiment on dead and living leaves using EPI instrument.

2.4 METHODOLOGY

SOURCES

1. Śruti - Upaniṣad - (103)

- *Praśnopaniṣat* - प्रश्नोपनिषत्
- *Kena Ūpaniṣat* - केन ऊपनिषत्
- *Kaṭhopaniṣat* - कठोपनिषत्
- *Muṇḍakopaniṣat* - मुण्डकोपनिषत्
- *Taittirīyopaniṣat* - तैत्तिरीयोपनिषत्
- *Aitareyopaniṣat* - ऐतरेयोपनिषत्
- *Chāndogyopaniṣat* - छान्दोग्योपनिषत्
- *Bṛhadāraṇyakopaniṣat* - बृहदारण्यकोपनिषत्

2. *Smṛti* - स्मृति

- *Śrīmadbhagavadgītā* || (श्रीमद्भगवद्गीता)
- *Yogavāsiṣṭhaḥ* (योगवासिष्ठः)
- *Pātañjalayogasūtrāṇi* (पातञ्जलयोगसूत्राणि)

3. Śāstrā - शास्त्रा

- *Vedānta-sāra* (वेदान्त-सार)
- *Pañcīkaraṇam* (पञ्चीकरणम्)
- *Pañcadaśī* (पञ्चदशी)

4. Tantra – तन्त्र (*Haṭhayoga* – हठयोग - Texts)

- *Haṭhayogapradīpikā* (हठयोगप्रदीपिका)
- *Ġheraṇḍa saṁhitā* (घेरण्ड संहिता)
- *Haṭharatnāvalī* (हठरत्नावली)

(Bharti & Samvid, 2013; Digambar & Gharote, 1997; Yogindra, 1990; Shankar Bhashyartha, 2010; shankaracharya, 2006; Shankracharya, 2003; Sivananda, 2008b; Mahayogendra, n.d.; Sarswati, 1984; Vidyaranya, n.d.; Swatmarama, 1998)

2.5 INCLUSION CRITERIA

The search lead to large number of references that include various texts; therefore in the current work we focused on those verses that link *Prāṇa* and *Prāṇamaya kośa* with special reference to major *Upaniṣat, Smṛtis, Śāstrās* and *Tantra.*

2.6 EXCLUSION CRITERIA

The exclusion criteria was set for those verses or references which merely talk about *Prāṇā* and *Prāṇamaya kośa* but do not explain in details their relevance in the context of this present work. Though, those verses or references might offer rich sources of information, for our work and its need, we restricted to the texts that served our purposes.

2.7 ETYMOLOGICAL MEANING OF PRĀṆA

1. प्रकर्षेण अनति इति प्राणः।

Prakarṣeṇa anati iti prāṇaḥ ।

That which moves itself and makes other to move or activate in action is

Prāṇa.

2. प्राणिति जीवति बहुकालमिति । प्र + अन् + अच्

Prāṇiti jīvati bahukālamiti। *pra* + *an* + *ac*।

That which lives for long duration – living beings in general

3. प्राणित्यनेनेति करणे प्र + अन् + घञ् वा । ब्रह्मा । इति चिकाण्डशेषः ॥ ह्नन्मारुतः ।

Prāṇityaneneti karaṇe pra + *an* + *ghañ vā*। *brahmā*। *iti cikāṇḍaśeṣaḥ*।। *hranmārutaḥ*।

Brahma who causes life – causative factor for life beings.

Meaning of Prāṇa in different texts

Prāṇa is a Saṁsakrita word constructed of the syllables PRA and AN. 'An' means movement and '*pra*' is a prefix meaning constant. Therefore, *prāṇa* means constant motion. This constant motion commences in the human being as soon as he is conceived in his mother's womb. *Prāṇa* is therefore a type of energy responsible for the body's life, heat and maintenance.

Tarkasangraha –

शरीरान्तस्सञ्चारी वायुः प्राणः।

Śarīrāntassañcārī vāyuḥ prāṇaḥ।

The air flowing inside the body is called *prāṇa*.

प्रश्नोपनिषत् – *Praśnopaniṣat*

एषोऽग्निस्तपत्येष सूर्य एष पर्जन्यो मघवानेष वायुः।

एष प्रथिवी रयिर्देवः सदसच्चाम्रतं च यत्॥

Eṣo'gnistapatyeṣa sūrya eṣa parjanyo maghavāneṣa vāyuḥ।
eṣa prathivī rayirdevaḥ sadasaccāmratam ca yat॥

It burns as fire, it is the sun, it is the rain; it is Indra, it is the wind, it is the earth, it is food. It is the luminous god. It is being and non−being; it is immortality.

(Praśnopaniṣat, Ch:2, V:5)

प्राणस्येदं वशे सर्वं त्रिदिवे यत् प्रतिष्ठितम्।

मातेव पुत्रान् रक्षस्व श्रीश्च प्रज्ञां च विधेहि न इति॥

Prāṇasyedaṁ vaśe sarvaṁ tridive yat pratiṣṭhitam ।
māteva putrān rakṣasva śrīśca prajñāṁ ca vidhehi na iti ॥ *13* ॥

All that exists here is under the control of prāṇa and also what exists in heaven. Protect us as a mother her sons; bestow upon us prosperity and wisdom.

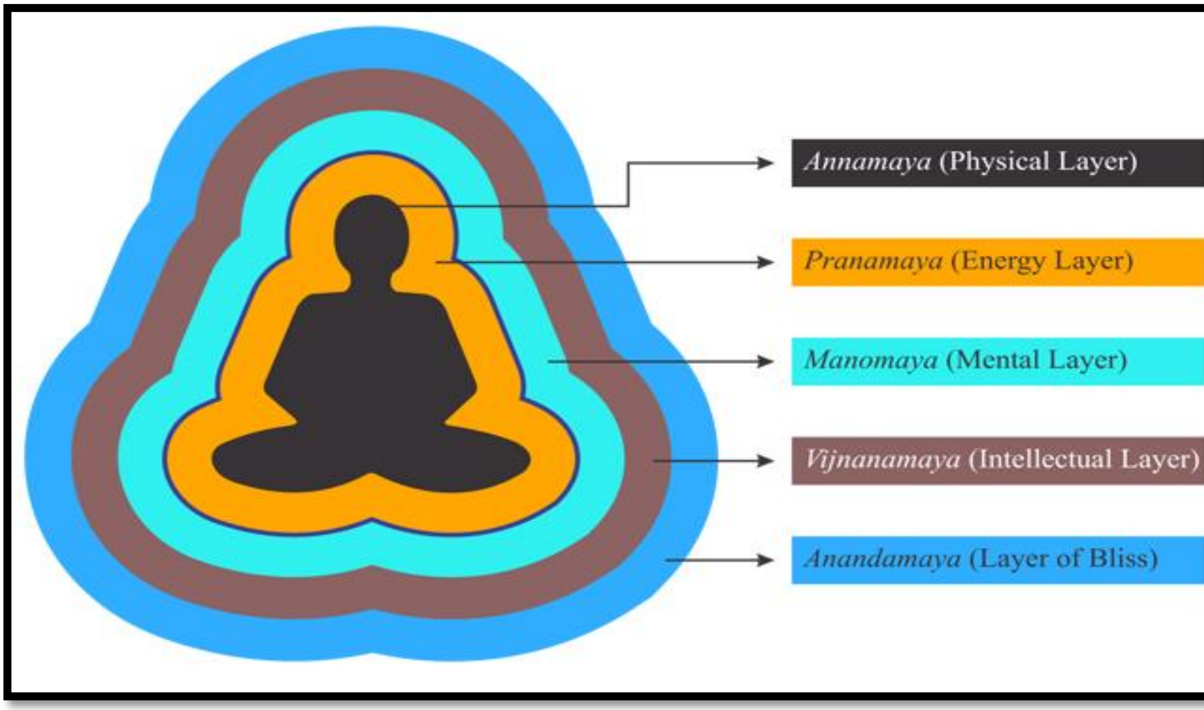
(Praśnopaniṣat, Ch:2, V:13)

The **Yogavāsiṣṭhaḥ** (one of the great Advaita scriptures) depicts *Prāṇa* as an alive form of expanded cosmic existence, without limits or boundaries. However, the ancient sage **Vasiṣṭha** also made it strong that there is some kind of personal *Prāṇa*, which encompasses about twelve inches around the body in all directions. He calls this personal *Prāṇa* "vadasanta." This can be roughly correspond to what we usually known it today as the aura).

Pañcakośa - पञ्चकोश

Pañcakośa (*Saṁsakrita*: पञ्चकोश; "five sheaths") from root *pañca*, "five" + *kośa*, "body", means five sheaths. According to yogic science, a human being is capable of experiencing five dimensions of existence, which are called *Pañcakośa* or five sheaths. These are the five spheres in which a human being lives at any given moment and they range from gross to subtle. The five sheaths are *Annamaya kośa*, the *kośa* of matter, the physical vehicle, the *Prāṇamaya kośa*, the *kośa* of *prāṇa*, the "vital" vehicle, the *Manomaya kośa*, the *kośa* of *Manas*, the mental vehicle, the *Vijñānamaya kośa*, the *kośa* of *Vijñāna*, the vehicle of Higher Reason and the *Ānandamaya kośa*, the *kośa* of *Ānanda* (joy or bliss). And when that vehicle is well developed there is that self-realization which involves ultimate experience of Unity with All.

Figure 1: *Graphical presentation of Pañcakośa*



The physical body (*Annamaya kośa*) is also called *Sthūla Śarīra*, "gross body." The soul body (*Ānandamaya kośa*) is also called *Kāraṇa Śarīra*, "causal body." The *Prāṇamaya*, *Manomaya* and *Vijñānamaya kośās* together comprise the *Sūkṣma Śarīra*, "subtle body," with the *Prāṇamaya* shell disintegrating at death.

The Five kośās

पञ्चकोशादियोगेन तत्तन्मय इव स्थितः।
शुद्धात्मा नीलवस्त्रादियोगेन स्फटिको यथा ॥१४ ॥

Pañcakośādiyogena tattanmaya iva sthitaḥ|
śuddhātmā nīlavastrādiyogena sphaṭiko yathā||14||

When covered by a blue cloths, a pure colorless crystal looks like the same. Similarly because of the union with the five *kośas*, the pure *Ātmā* (soul) appears to be like them.

(Ātmabodha, V:14)

The *Pañcakośa* (five sheaths) concept is mentioned with in-depth understanding in the *Taittirīyopaniṣat*.

Table 2: Explanation of *Pañcakośa* from gross level to fine

***Pañcakośa* (पञ्चकोश)**			
Annamaya kośa	Matter	Physical	Physical body and senses
Prāṇamaya kośa	Vital Air	Energy	Driving force behind the physical aspect of the senses and the operation of the physical body
Manomaya kośa	Mind	Mental	Processing, reason, logic and emotion
Vijñānamaya kośa	Intellect	Wisdom	Faculty which discriminates
Ānandamaya kośa	Bliss	Center of Consciousness	Independent of any reason or stimulus

प्राणमय कोश - *Prāṇamaya kośa*

The next of the five *kośa* (*Annamaya kośa, prāṇamaya kośa, manomaya kośa, vijñānamaya kośa* and *ānandamaya kośa*) is *prāṇamaya kośa*. *Prāṇa* means energy. This *Prāṇa* is a part of cosmic life. Each and every creature, each and every thing in this world is a part of cosmic life. *Prāṇa* is the force or energy for all kinds of motion. It produces the subtle vibrations related to breath, and which are the driving force behind the physical aspect of the senses and the operation of the physical body. It allows the invisible indweller, our True Self to be able to animate in the external world. At the same time, however, it allows the eternally still, silent center of consciousness to be mistakenly identified as the moving, visible physical body.

Prāṇa is known as constant motion throughout life. The tiniest part of an atom has *Prāṇa*. Wherever there is *Prāṇa* there is movement, growth, change and activity and where there is no *Prāṇa* there is no activity. When we die, the body dissipates, because it has become completely bereft of *Prāṇa*. *Prāṇa* is one item of our total composition and should also be dealt with in yoga. If the *Prāṇās* are agitated or there is a *Prāṇa* imbalance, there is imbalance everywhere. To understand *Prāṇa* we need to know a little about positive and negative atoms. The *Prāṇās* are in the atmosphere in the form of positive and negative ions, which keep on bouncing, migrating and reintegrating. A balance has to be created between them.

The science of the behavior of positive and negative ions makes us understand the importance of balancing the *Prāṇa* in the body, because *Prāṇa* is known to be representing the positive energy whereas, mind representing the negative energy in the body. Balance of both negative and positive energy leads to illumination and harmony in everything. The *Prāṇa* is like electricity which is responsible for the functioning of all electrical items such as microphone or light bulb, similarly the *Prāṇa* is responsible for action of *karmendriyās* (the organs of action). As any of electrical item is set to function on a supply of 100 volts work on that voltage. If the voltage supply to say 400 volts instead of 100 volts, it will burn. If electricity is at 50 volts, then also will be a crisis. Therefore, electricity has to be adjusted for the proper functioning of the electrical items. Similarly, coordination between the *Prāṇa* and the indriyās or sense organs is required. Too much *Prāṇa* might results into hyperactivity and low level of *Prāṇa* might result in hypo activity. The *Prāṇa* is the force behind all *karmendriyās*. *Prāṇamaya kośa* is the energy in *Annamaya kośa*.

Pranayama (the yogic practice by which the dimension of *Prāṇa* is extended) is the best tool to purify the *Prāṇamaya kośa*. As the *Prāṇa* penetrates into each and every cell and fiber of the body by practice of pranayama. The pranayama practice regulates the *Prāṇic* energy, prevents energy blockage and helps in proper functioning of *Prāṇa* in the body. Whereas, in meditation, another practice of yoga, we become aware of prāṇamaya koça, explore it, and then go inward, to and through the other *kośa* (Sarswati, 1984).

2.8 *PRĀṆA* AND *PRĀṆAMAYA KOŚĀ* FROM VARIOUS ANCIENT LITERATURES

Upaniṣad

केनोपनिषत् - *Kenopaniṣat*

ॐ केनेषितं पतति प्रेषितं मनः केन प्राणः प्रथमः प्रैति युक्तः ।
केनेषितां वाचमिमां वदन्ति चक्षुः श्रोत्रं क उ देवो युनक्ति ॥

Om keneṣitaṁ patati preṣitaṁ manaḥ kena prāṇaḥ prathamaḥ praiti yuktaḥ |
Keneṣitāṁ vācamimāṁ vadanti cakṣuḥ śrotraṁ ka u devo yunakti || 1||

The disciple asked: Om. By whose will directed does the mind proceed to its object? At whose command does the Prāṇa, the foremost, do its duty? At whose will do men utter speech? Who is the god that directs the eyes and ears?

(Kenopaniṣat, ch: 1 V:1)

श्रोत्रस्य श्रोत्रं मनसो मनो यद् वाचो ह वाचं स उ प्राणस्य प्राणः।

चक्षुषश्चक्षुरतिमुच्य धीराः प्रेत्यास्माल्लोकादमृता भवन्ति॥

Śrotrasya śrotraṁ manaso mano yad vāco ha vācaṁ sa u prāṇasya prāṇaḥ ।

Cakṣuṣaścakṣuratimucya dhīrāḥ pretyāsmāllokādamṛtā bhavanti ।।

The teacher replied: It is the Ear of the ear, the Mind of the mind, the Speech of speech, the Life of life, and the Eye of the eye. Having detached the Self from the sense−organs and renounced the world, the Wise attain to Immortality.

(Kenopaniṣat, ch: 1 V:2)

यत्प्राणेन न प्राणिति येन प्राणः प्रणीयते।

तदेव ब्रह्म त्वं विद्धि नेदं यदिदमुपासते॥

Yatprāṇena na prāṇiti yena prāṇaḥ praṇīyate ।

Tadeva brahma tvaṁ viddhi nedaṁ yadidamupāsate ।।

That which cannot be smelt by the breath, but by which the breath smells an object−That alone know as Brahman, and not that which people here worship.

(Kenopaniṣat, ch: 1 V:3)

कठोपनिषत् - *Kaṭhopaniṣat*

या प्राणेन सम्भवत्यदितिर्देवतामयी।

गुहां प्रविश्य तिष्ठन्तीं या भूतेभिर्व्यजायत। एतद्वै तत्॥

Yā prāṇena sambhavatyaditirdevatāmayī ।

Guhāṁ praviśya tiṣṭhantīṁ yā bhūtebhirvyajāyata । *etadvai tat* ।।

This Supreme Being is not merely the transcendent presence called Brahman, He is not merely the Supreme called ishvara, He is also the cosmic Prāṇa, the life of all beings."

(Kaṭhopaniṣat, ch: 2.1 V: 7)

Interpretation

The life we breathe, the energy that we breathe, is all the expression of this hiranyagarbha-*Prāṇa*. It is the cosmic *Prāṇa* that is breathed, by all—by people, plants, animals etc., all move because of the *Prāṇa* that enlivens them. Life does not mean living in a world. It is not activity of any kind. To live is itself life, not merely to do something, or to speak or execute a deed. Life is the capacity to exist as different from manifested matter. It is not protoplasm; it is not thought. Prāṇa and life are only different words meaning the same. And it is difficult to explain how a human being or animal differs from inanimate matter, just as it is difficult to prove that we exist. All that is connected with God is mysterious.

ऊर्ध्वं प्राणमुन्नयत्यपानं प्रत्यगस्यति ।

मध्ये वामनमासीनं विश्वे देवा उपासते ॥

Ūrdhvaṁ prāṇamunnayatyapānaṁ pratyagasyati |

Madhye vāmanamāsīnaṁ viśve devā upāsate ||

He (Brahman) sends up the Prāṇa and throws the Apana downwards, that adorable one seated in the centre, all devas worship. (II.2.3)

(Kaṭhopaniṣat, ch: 2.2 V: 3)

न प्राणेन नापानेन मर्त्यो जीवति कश्चन ।

इतरेण तु जीवन्ति यस्मिन्नेतावुपाश्रितौ ॥

Na prāṇena nāpānena martyo jīvati kaścana |

Itareṇa tu jīvanti yasminnetāvupāśritau ||

Not by Prāṇa, not by Apana does any mortal live, but it is by some other on which these two depend that men live.

(Kaṭhopaniṣat, ch: 2.2 V: 5)

मुण्डकोपनिषत् - *Muṇḍakopaniṣat*

तपसा चीयते ब्रह्म ततोऽन्नमभिजायते ।

अन्नात् प्राणो मनः सत्यं लोकाः कर्मसु चामृतम् ॥

Tapasā cīyate brahma tato'nnamabhijāyate |
Annāt prāṇo manaḥ satyaṁ lokāḥ karmasu cāmṛtam ||

Brahman expands by means of austerity, and from It primal matter is produced; from matter, Prāṇa; from Prāṇa, mind; from mind, the elements; from the elements, the worlds; thence works, and from the works, their immortal fruits.

(Muṇḍakopaniṣat, ch: 1.1 V: 8)

एतस्माज्जायते प्रणो मनः सर्वेन्द्रियाणि च ।

खं वायुर्ज्योतिरापः पृथिवी विश्वस्य धारिणी ॥

Etasmājjāyate praṇo manaḥ sarvendriyāṇi ca |
Khaṁ vāyurjyotirāpaḥ pṛthivī viśvasya dhāriṇī ||

From Him are born Prāṇa, mind, all the sense–organs, Akasa, air, fire, water, and earth, which supports all.

(Muṇḍakopaniṣat, ch: 2.1 V: 3)

अग्नीर्मूर्धा चक्षुषी चन्द्रसूर्यौ दिशः श्रोत्रे वाग् विवृताश्च वेदाः ।

वायुः प्रणो हृदयं विश्वमस्य पद्भ्यां पृथिवी ह्येष सर्वभूतान्तरात्मा ॥

Agnīrmūrdhā cakṣuṣī candrasūryau diśaḥ śrotre vāg vivṛtāśca vedāḥ |
Vāyuḥ praṇo hṛdayaṁ viśvamasya padbhyāṁ pṛthivī hyeṣa sarvabhūtāntarātmā ||

The heavens are His head; the sun and moon, His eyes; the quarters, His ears; the revealed Vedas, His speech; the wind is His breath; the universe, His heart. From his feet is produced the earth. He is, indeed, the inner Self of all beings.

(Muṇḍakopaniṣat, ch: 2.1 V: 4)

तस्माच्च देवा बहुधा सम्प्रसूताः साध्या मनुष्याः पशवो वयांसि ।

प्राणापानौ व्रीहियवौ तपश्च श्रद्ध सत्यं ब्रह्मचर्यं विधिश्च ॥

Tasmācca devā bahudhā samprasūtāḥ sādhyā manuṣyāḥ paśavo vayāṁsi ।
Prāṇāpānau vrīhiyavau tapaśca śraddha satyaṁ brahmacaryaṁ vidhiśca ।। 7।।

By Him are begotten the various devas, the sadhyas, men, cattle, birds, and also *Prāṇa* and *Apana*, rice and corn, penance, faith, truth, continence, and law.

(Muṇḍakopaniṣat, ch: 2.1 V: 7)

सप्त प्राणाः प्रभवन्ति तस्मात्सप्तार्चिषः समिधः सप्त होमाः ।

सप्त इमे लोका येषु चरन्ति प्राणागुहाशया निहिताः सप्त सप्त ॥

Sapta prāṇāḥ prabhavanti tasmātsaptārciṣaḥ samidhaḥ sapta homāḥ ।
Sapta ime lokā yeṣu caranti prāṇāguhāśayā nihitāḥ sapta sapta ।। 8।।

From Him have sprung the seven *Prāṇas*, the seven flames, the seven kinds of fuel, the seven oblations, and also the seven planes where move the *Prāṇas*, lying in the cave, which are seven in each living being.

(Muṇḍakopaniṣat, ch: 2.1 V: 8)

तैत्तिरीयोपनिषत् – *Taittirīyopaniṣat*

प्राणं देवा अनु प्राणन्ति । मनुष्याः पशवश्च ये । प्राणो हि भूतानामायुः । तस्मात् सर्वायुषमुच्यते ।

सर्वमेव त आयुर्यन्ति । ये प्राणं ब्रह्मोपासते । प्राणो हि भूतानामायुः । तस्मात् सर्वायुषमुच्यत इति ।

तस्यैष एव शारीर आत्मा । यः पूर्वस्य । तस्माद्वा एतस्मात् प्राणमयात् । अन्योऽन्तर आत्मा मनोमयः ।

तेनैष पूर्णः। स वा एष पुरुषविध एव। तस्य पुरुषविधताम्। अन्वयं पुरुषविधः। तस्य यजुरेव शिरः।
ऋग्दक्षिणः पक्षः। सामोत्तरः पक्षः। आदेश आत्मा। अथर्वाङ्गिरसः पुच्छं प्रतिष्ठा। तदप्येष श्लोको भवति ॥

Prāṇaṁ devā anu prāṇanti | manuṣyāḥ paśavaśca ye | prāṇo hi bhūtānāmāyuḥ | tasmāt sarvāyuṣamucyate | sarvameva ta āyuryanti | ye prāṇaṁ brahmopāsate | prāṇo hi bhūtānāmāyuḥ | tasmāt sarvāyuṣamucyata iti | tasyaiṣa eva śārīra ātmā | yaḥ pūrvasya | tasmādvā etasmāt prāṇamayāt | anyo'ntara ātmā manomayaḥ | tenaiṣa pūrṇaḥ | sa vā eṣa puruṣavidha eva | tasya puruṣavidhatām | anvayaṁ puruṣavidhaḥ | tasya yajureva śiraḥ | ṛgdakṣiṇaḥ pakṣaḥ | sāmottaraḥ pakṣaḥ | ādeśa ātmā | atharvāṅgirasaḥ pucchaṁ pratiṣṭhā | tadapyeṣa śloko bhavati ||

"The gods breathe after the *Prāṇa*, so also do men and cattle; for the *Prāṇa* is the life of creatures. Therefore it is called the life of all. Those who worship the *Prāṇa* as Brahman obtain a full life; for the *Prāṇa* is the life of creatures. Therefore it is called the life of all." This sheath of the *Prāṇa* is the embodied soul of the former. Verily, different from this sheath, which consists of the essence of the *Prāṇa*, but within it, is another self, which consists of the mind. By this the former is filled. This too has the shape of a man. Like the human shape of the former is the human shape of the latter. The Yagur−Veda is its head, the Rig−Veda is its right wing, the Sama−Veda is its left wing, the teaching is its trunk, the hymns of Atharva and Angiras are its tail, its support.

(Taittirīyopaniṣat, ch: 2.3 V: 1)

An ancient illustration of the practice of mana (reflection) is found in Taittiriya Upanisad. Bhrigu (Son of Varuna) approached his father (Varun), as a spiritual preceptor and asked to be taught about Brahman. In response, his father declared, "Brahman is That from which the world has proceeded, That by which the world is sustained, and That into which the world dissolves. So practice austerity and reflect, my son, and discover what Brahman is." Following his father's instruction, Bhrigu practiced reflection for a year on what he had studied in the scriptures as well as his own experience. Then he returned to his father and eagerly stated his conclusions: Matter is Brahman. The entire world emanates from matter; matter sustains it; into the matter the world dissolves." Hearing this, Varuna quietly replied, "Continue practicing austerity and reflect, my son. Austerity is Brahman."

Bhrigu continued the practice *Manana* (contemplation), and after about another year of practice he returned to his father with the conclusion that prana is Brahman. Matter in itself is blind and inert, but a subtle energy, or vital force (*Prāṇa*), moves and sustains every atom and electron in the vast universe of matter. Again Varuna, with a twinkle in his eye, told his son to continue practicing austerity. Bhrigu to Varun..

प्राणो ब्रह्मेति व्यजानात्। प्राणाद्ध्येव खल्विमानि भूतानि जायन्ते। प्राणेन जातानि जीवन्ति। प्राणं प्रयन्त्यभिसंविशन्तीति। तद्विज्ञाय। पुनरेव वरुणं पितरमुपससार। अधीहि भगवो ब्रह्मेति। त होवाच। तपसा ब्रह्म विजिज्ञासस्व। तपो ब्रह्मेति। स तपोऽतप्यत।॥

Prāṇo brahmeti vyajānāt | prāṇāddhyeva khalvimāni bhūtāni jāyante | prāṇena jātāni jīvanti | prāṇaṁ prayantyabhisaṁviśantīti | tadvijñāya | punareva varuṇaṁ pitaramupasasāra | adhīhi bhagavo brahmeti | ta hovāca | tapasā brahma vijijñāsasva | tapo brahmeti | sa tapo'tapyata | ||

He realized that the *Prāṇa* is Brahman; for from the *Prāṇa*, verily, are these beings born; by the *Prāṇa*, when born, do they live; into the *Prāṇa* do they enter, do they merge. Having realized this, he approached his father again and said: "Venerable Sir, teach me Brahman." To him, the son, he said this: "Seek to know Brahman by means of austerities. For austerities are the means of knowing Brahman." He practiced austerities.

(Taittirīyopaniṣat, ch: 3.3 V: 1)

As his practice deepened, Brigu was led to inquire mind and then intellect as Brahman. Going beyond the unconscious plane of ignorance through the experience of samadhi or super consciousness, Bhrigu had a direct experience of the bliss of Brahman--the true nature of Brahman. When he relayed to his father that ananda, or bliss, is Brahman, his father became extremely happy, and told Bhrigu that it was no longer necessary to practice austerity. By negating each previous level of understanding, his reflection had finally led him to the highest experience of Brahman.

ऐतरेयोपनिषत् - *Aitareyopaniṣat*

तमभ्यतपत्तस्याभितप्तस्य मुखं निरभिद्यत यथाऽण्डं
मुखाद्वाग्वाचोऽग्निर्नासिके निरभिद्येतं नासिकाभ्यां प्राणः ॥

Tamabhyatapattasyābhitaptasya mukhaṁ nirabhidyata yathā'ṇḍaṁ
mukhādvāgvāco'gnirnāsike nirabhidyetaṁ nāsikābhyāṁ prāṇaḥ ||

He brooded over Him. From Him, so brooded over, the mouth was separated out, as with an egg; form the mouth, the organ of speech; from speech, fire, the controlling deity of the organ. Then the nostrils were separated out; from the nostrils, the organ of breath.

(Aitareyopaniṣat, ch: 1.1 V: 4)

प्राणाद्वायुरक्षिणी - *Prāṇādvāyurakṣiṇī*

अग्निर्वाग्भूत्वा मुखं प्राविशद्वायुः प्राणो भूत्वा नासिके
प्राविशदादित्यश्चक्षुर्भूत्वाऽक्षिणी प्राविशाद्दिशः
श्रोत्रं भूत्वा कर्णौ प्राविशन्नोषधिवनस्पतयो लोमानि भूत्वा

त्वचम्प्राविशंश्चन्द्रमा मनो भूत्वा हृदयं प्राविशन्मृत्युरपानो
भूत्वा नाभिं प्राविशदापो रेतो भूत्वा शिश्नं प्राविशन्॥

Agnirvāgbhūtvā mukhaṁ prāviśadvāyuḥ prāṇo bhūtvā nāsike
prāviśadādityaścakṣurbhūtvā'kṣiṇī prāviśāddiśaḥ
śrotraṁ bhūtvā karṇau prāviśannoṣadhivanaspatayo lomāni bhūtvā
tvacamprāviśaṁścandramā mano bhūtvā hṛdayaṁ prāviśanmṛtyurapāno
bhūtvā nābhiṁ prāviśadāpo reto bhūtvā śiśnaṁ prāviśan ||

The deity fire became the organ of speech and entered the mouth. Air became breath and entered the nostrils. The sun became sight and entered the eyes; the quarters of space became hearing and entered the ears. Plants and trees, the deity of air, became hairs and entered the skin. The moon became the mind and entered the heart. Death became the Apana and entered the navel. The waters became semen and entered the virile member.

(Aitareyopaniṣat, ch: 1.2 V: 4)

छान्दोग्योपनिषत् - *Chāndogyopaniṣat*

Prāṇa, the subtle life force in the yogi's body, must also be kept pure, as it affects everything in the physical and astral bodies, and has a major influence on meditation, during which the *Prāṇas* must be as pure and subtle as possible, since the mental energies and the *Prāṇa* interact with one another intimately. About the *Prāṇa*, Uddalaka says: "Water, when drunk, becomes divided into three parts. What is its grossest ingredient, that becomes urine; what is the middling ingredient, that becomes blood; and what is the subtlest ingredient, that becomes *Prāṇa*" (*Chāndogyopaniṣat*, 6.5.1,2). What is said about water stands for any liquid, and we must be as careful about that as about our food.

"Hence, mind is made up of food, Prāṇa is made up of water" (*Chāndogyopaniṣat* 6.5.4). Then he repeats this, giving examples.

The Physical Nature of the Mind, the Prāṇa and Speech

अन्नमशितं त्रेधा विधीयते तस्य यः स्थविष्ठो धातुस्तत्पुरीषं

भवति यो मध्यमस्तन्मासं योऽणिष्ठस्तन्मनः ॥

Annamaśitaṁ tredhā vidhīyate tasya yaḥ sthaviṣṭho dhātustatpurīṣaṁ
bhavati yo madhyamastanmāsaṁ yo'ṇiṣṭhastanmanaḥ ||

Food when eaten becomes divided in three ways. Of it that which is the grossest ingredient, that turns into feces. That which is the medium constituent becomes flesh. That which is the subtlest becomes mind.

(Chāndogyopaniṣat, ch: 6.5 V:1)

आपः पीतास्त्रेधा विधीयन्ते तासां यः स्थविष्ठो धातुस्तन्मूत्रं

भवति यो मध्यमस्तल्लोहितं योऽणिष्ठः स प्राणः ॥

Āpaḥ pītāstredhā vidhīyante tāsāṁ yaḥ sthaviṣṭho dhātustanmūtraṁ
bhavati yo madhyamastallohitaṁ yo'ṇiṣṭhaḥ sa prāṇaḥ ||

Water when drunk becomes divided in three ways. Of it, that which is the grossest ingedient, that turns into urine. That which is the medium constituent, that becomes blood. That which is the subtlest becomes vital force.

(Chāndogyopaniṣat, ch: 6.5 V:2)

तेजोऽशितं त्रेधा विधीयते तस्य यः स्थविष्ठो धातुस्तदस्थि

भवति यो मध्यमः स मज्जा योऽणिष्ठः सा वाक् ॥

Tejo'śitaṁ tredhā vidhīyate tasya yaḥ sthaviṣṭho dhātustadasthi
bhavati yo madhyamaḥ sa majjā yo'ṇiṣṭhaḥ sā vāk ||

Fire when eaten becomes divided in three ways. Of it, that which is the grossest ingedient, that becomes bone..That which is the medium constituent, that becomes merrow. That which is the subtlest that becomes (the organ of) speech.

(Chāndogyopaniṣat, ch: 6.5 V:3)

अन्नमयहि सोम्य मनः आपोमयः प्राणस्तेजोमयीवागिति भूय

एव मा भगवान्विज्ञापयत्विति तथा सोम्येति होवाच ॥

Annamayahi somya manaḥ āpomayaḥ prāṇastejomayīvāgiti bhūya eva mā bhagavānvijñāpayatviti tathā somyeti hovāca ||

'O good looking one, mind is surely made of food, vital force is made of water, and speech is made of fire.'

(Chāndogyopaniṣat, ch: 6.5 V:4)

Though *Prāṇa* is known to be made out of water, but it also comes into the body via breath. The practice of proper breathing or *prāṇāyāma* increase *Prāṇa* into our system literally makes us feel more alive and it invigorates and powers *Prāṇamaya kośa*.

बृहदारण्यकोपनिषत् - *Bṛhadāraṇyakopaniṣat*

स त्रेधाऽऽत्मानं व्यकुरुताऽऽदित्यं तृतीयम् वायुं तृतीयगं स एष प्राणस्त्रेधा विहितस्तस्य प्राची दिक्शिरोऽसौ चासौ चेर्मावाथास्य प्रतीची दिक्पुच्छमसौ चासौ च सक्थ्यौदक्षिणा चोदीची च पार्श्वेद्यौः पृष्ठम् अन्तरिक्षमुदरम् इयमुरः स एषोऽप्सु प्रतिष्ठितो यत्र क्व चैतितदेव प्रतितिष्ठत्येवं विद्वान्॥

Sa tredhā''tmānaṁ vyakurutā''dityaṁ tṛtīyam vāyuṁ tṛtīyagṁ sa eṣa prāṇastredhā vihitastasya prācī dikṣiro'sau cāsau cermāvāthāsya pratīcī dikpucchamasau cāsau ca sakthyaudakṣiṇā codīcī ca pārśvedyauḥ pṛṣṭham antarikṣamudaram iyamuraḥ sa eṣo'psu pratiṣṭhito yatra kva caititadeva pratitiṣṭhatyevaṁ vidvān ||

He divided Himself into three: the sun one—third and the air one—third. Thus Prāṇa is divided into three. His head is the east and His arms are that (the north—east) and that (the south—east). His hinder part is the west and His two hip—bones are that (the north—west) and that (the south—west). His sides are the south and the north, His back is heaven, His belly is the intermediate region and His chest is the earth. Thus He stands firm on water. He who knows this stands firm wherever he goes.

(Bṛhadāraṇyakopaniṣat, ch: 1.1 V: 3)

(Smratīs)

योगवासिष्ठः - *Yogavāsiṣṭhaḥ*

Flow of *Prāṇa* become calm within

अष्टादशः सर्गः - *Aṣṭādaśaḥ Sargaḥ*

इति चित्तं समाधाय तस्थौ अस्पन्दितेन्द्रियः ।

अन्तरेव शशामास्य क्रमेण प्राणसण्ततिः ॥

Iti cittaṁ samādhāya tasthau aspanditendriyaḥ|
antareva śaśāmāsya krameṇa prāṇasaṇtatiḥ||

Concentrating the mind thus, he remained without making his senses throb (or move). Gradually, the flow of his *Prāṇa* (or vital air) just became calm (or was extinguished) within.

(Yogavāsiṣṭhaḥ, Ch: XVIII V: 9)

विंशः सर्गः

Viṁśaḥ Sargaḥ

Contemplation on *Prāṇa* is the cause to a long life here

आत्मचिन्ता महाश्रेश्ठा सर्वसंकल्पवर्जिता ॥

सर्वदुःखक्षयकरि सर्वसौभाग्यवर्धिनी ।

कारणं जीवितस्येह प्राणचिन्ता समाश्रिता ॥

Ātmacintā mahāśreśṭhā sarvasaṅkalpavarjitā||
sarvaduḥkhakṣayakari sarvasaubhāgyavardhinī|
kāraṇaṁ jīvitasyeha prāṇacintā samāśritā||

The contemplation of the self, destitute of all ideation, is the most excellent (means) that causes the destruction of all sorrows and increases all blessedness. The contemplation of *Prāṇa* (or bio-energy) when practiced, is the cause of (a long) life here.

(Yogavāsiṣṭhaḥ, Ch: XXI, V: 43-44)

The cause of long life

रेचकः पूरकश्चैव कुम्भकश्च त्रिधा स्थिताः ॥

बाह्यश्चाभ्यन्तरश्चेति तत्तलक्षणलक्षिताः ।

Recakaḥ pūrakaścaiva kumbhakaśca tridhā sthitāḥ||
bāhyaścābhyantaraśceti tattalakṣaṇalakṣitāḥ|

The exhalation,, the inhalation and the retention exist as the three parts (of control of *Prāṇa*). They are characterised by the attributes, external and internal.

(Yogavāsiṣṭhaḥ, Ch: XXI, V: 53)

चिरजीवितकारणम् – *Cirajīvitakāraṇam* (teh cause of long life)

अव्यग्रं अस्मिन् व्यापारे ब्राह्मं परिहरन् मनः ॥

दिनैः कतिपयैरेव परं आप्नोति केवलम् ।

Avyagram asmin vyāpāre brāhmaṁ pariharan manaḥ||
dinaiḥ katipayaireva param āpnoti kevalam|

Steady in this practice, avoiding external contacts, the mind attains to the Supreme (state) absolutely, merely in a matter of days.

(Yogavāsiṣṭhaḥ, Ch: XXI, V: 54)

एषा हि चित्तविश्रान्तिः मया प्राणसमाधिना ॥

क्रमेणानेन संप्राप्ता स्वयं आत्मनि निर्मले ।

Eṣā hi cittaviśraantiḥ mayā prāṇasamādhinā||
krameṇānena samprāptā svayam ātmani nirmale|

By this method of bringing together (or accomplishment) of the vital airs, this repose of mind in the stainless self was indeed obtained by me spontaneously.

(Yogavāsiṣṭhaḥ, Ch: XXI, V: 55)

Vital air productive of superhuman power

पञ्चविंशः सर्गः *Pañacaviṁśaḥ Sargaḥ*

चूडालायाः कथायां च प्रसङ्गपतितां इमाम् ॥

प्राणादिपवनाभ्यासक्रियां सिद्धिफलां श्रुणु।

Cūḍālāyāḥ kathāyāṁ ca prasaṅgapatitām imām||
prāṇādipavanābhyāsakriyāṁ siddhiphalāṁ śruṇu|

Hear this teaching about the practice of (controlling) *Prāṇa* and other vital airs productive of superhuman powers (or faculties), whih has occured in the topic of Choodaalaa's story.

(Yogavāsiṣṭhaḥ, Ch: XXV, V: 23)

Bio-energy abides in all living beings

कीटादिष्वपि सर्वेसु मर्मस्थानं समाश्रिता॥

भोगिवत् मण्डलाकारा सर्वदा स्पन्दरूपिणी।

पावनि परमा शक्तिः पवमानेन तिष्ठति॥

Kīṭādiṣvapi sarvesu marmasthānaṁ samāśritā||
bhogivat maṇḍalākārā sarvadā spandarūpiṇī|
pāvani paramā śaktiḥ pavamānena tiṣṭhati||

In all beings, even in worms and the like, resorting to the vital part of the body there abides, along with the vital air (or bio-energy), a pure (or purifying) power, coiled in form like a snake and always vibratory in nature.

(Yogavāsiṣṭhaḥ, Ch: XXV, V: 27-28)

Kuṇḍalinī

साऽतः कुण्डलिनी प्रोक्ता नाडयो ह्रदयकोशगाः।

अस्यां समस्ताः संबद्धाः सैव प्राणमयी स्म्रता॥

प्राणापानस्वरूपतत्वात् अध ऊर्ध्वं व्रजत्यसौ।

Sā'taḥ kuṇḍalinī proktā nāḍayo hradayakośagāḥ|
asyāṁ samastāḥ sambaddhāḥ saiva prāṇamayī smratā||
prāṇāpānasvarūpatatvāt adha ūrdhvaṁ vrajatyasau|

Therefore, this power (or energy) is called Kundalinee (or the coiled one). All the Naadee-s (or channels of bio-energy) in (or going to) the receptacle of the heart are connected with this. That alone is considered as consisting of *Prāṇa* (or bio-energy). On account of tis inherent nature being *Prāṇa* and *Apaana*, it moves up and down (in the body).

(Yogavāsiṣṭhaḥ, Ch: XXV, V: 29)

आधिव्याधयः- Āadhivyādhayaḥ (disease of the mind and body)

यधन्तः मारुतो रूद्धः व्याधिः जन्तोः न जायते ॥

देहदुःखं विदुः व्याधिं आध्याख्यं वासनामयम् ।

Yadhantaḥ māruto rūddhaḥ vyādhiḥ jantoḥ na jāyate||

dehaduḥkhaṁ viduḥ vyādhim ādhyākhyaṁ vāsanāmaym|

If the vital air is bound (or rrestrained) within, physical ailment is not produced in a living being. The distress of the body is known as (physical) disease. Mental affliction consists of mental impressions (or knowledge drived from memory agitating the human psyche).

(Yogavāsiṣṭhaḥ, Ch: XXV, V: 30)

दुरन्नाभ्यवहारेण दुर्देशाक्रमणेन च ॥

दुष्कालव्यवहारेण दुर्जनासङ्गदोषतः ।

क्षीणत्वात् वाऽतिपूर्णात्वात् नाडीनां रन्ध्रसंततौ ॥

प्राणे विधुरतां याते व्याधिः देहे प्रवर्तते ।

Durannābhyavahāreṇa durdeśākramaṇena ca||

duṣkālavyavahāreṇa durjanāsaṅgadoṣataḥ|

kṣīṇatvāt vā'tipūrṇātvāt nāḍīnāṁ randhrasantatau||

prāṇe vidhuratāṁ yāte vyādhiḥ dehe pravartate|

Disease occurs in the body when *Prāṇa* (bio-energy) reaches deprivation in the series of the cavities of the Naadee-s (or channels of bio-energy such as nerves, arteries and veins), due to the eating of bad food, the occupation of bad places, the conduct of affairs in unsuitable time, the evil of association with bad people and by the dimminution or overfilling (of the system with the necessities of life).

(Yogavāsiṣṭhaḥ, Ch: XXV, V: 31-32)

चित्ते विधुरिते देहः संक्षोभं उपयाति हि।

संक्षोभात् साम्यं उत्सृज्य दहन्ति प्राणवायवः॥

Citte vidhurite dehaḥ saṅkṣobham upayāti hi|
saṅkṣobhāt sāmyam utsrajya dahanti prāṇavāyavaḥ||

When the mind is agitated, the body indeed goes to the state of agitation. On account of agitation, the vital airs (or current of bio-energy) flow, giving up evenness.

(Yogavāsiṣṭhaḥ, Ch: XXV, V: 35)

असमे वहति प्राणे नाड्यो यान्ति विसंस्थितिम्।

कुजीर्णत्वं अजीर्णत्वं अतिजीर्णत्वमेव वा॥

दोषायैव प्रयात्यन्नं नाडीप्राणविपर्ययात्।

Asame vahati prāṇe nāḍayo yānti visaṁsthitim|
kujīrṇatvam ajīrṇatvam atijīrṇatvameva vā||
doṣāyaiva prayātyannaṁ nāḍīprāṇaviparyayāt|

When the (currents of) bio-energy flow unevenly, (their) channels (or Naadee-s) attain to an improper condition. Because of the perverseness of the bio-energy currents in their channels, the food (which is eaten) goes forth only towards (causing) harm by bad digestion, indigestion or even over-digestion.

(Yogavāsiṣṭhaḥ, Ch: XXV, V: 36)

How to regulate vital air?

सत्वशुद्ध्या वहन्त्येते क्रमेण प्राणवायवः॥

जरयन्ति तथाऽन्नानि व्याधिः तेन विनश्यति।

Satvaśuddhyā vahantyete krameṇa prāṇavāyavaḥ||
jarayanti tathā'nnāni vyādhiḥ tena vinaśyati|

By the purity of mind these vital airs flow in regular course; so also, the foods are digested. Because of that, physical eilments parishes.

(Yogavāsiṣṭhaḥ, Ch: XXV, V: 40)

Śāstrās

वेदान्त-सार - *Vedānta-Sāra*

एतेषां प्राणादिष्वन्तर्भावात्प्राणादयः।पञ्चैवेति केचित्॥

Eteṣāṁ prāṇādiṣvantarbhāvātprāṇādayaḥ pañcaiveti kecit||

Some say that on account of their being included in *Prāṇa* etc., the vital forces are really five in numbers.

(Vedānta-sāra, 86)

वायवः प्राणापानव्यानोदानसमानाः॥

Vāyavaḥ prāṇāpānavyānodānasamānāḥ||

The five vital forces are the *prāṇa*, *apāna*, *vyāna*, *udāna* and *samāna*.

(Vedānta-sāra, 77)

एतत्प्राणादिपञ्चकमाकाशादिगतरजोंशेभ्यो मिलितेभ्य उतपध्ये॥

Etatprāṇādipañcakamākāśādigatarajoṁśebhyo militebhya utapadhye||

These five vital forces, viz., *Prāṇa* etc. are produced from the combination of the active (Rajas) particles of other etc.

(Vedānta-sāra, 87)

इदं प्राणदिपञ्च्कं कर्मेंद्रियैः सहितं सत्प्राणमयकोशो भवति। अस्य क्रियात्मकत्वेन रजोंशकायेत्वम्॥

Idaṁ prāṇadipañckaṁ karmedriyaiḥ sahitaṁ satprāṇamayakośo bhavati| asya kriyātmakatvena rajoṁśakāyetvam||

These five vital forces such as *Prāṇa* etc., together with organs of action, constitute the vital sheath (*Prāṇamaya kośa*). Its active nature shows that it is the product of the particles of Rajas.

(Vedānta-sāra, 88)

पञ्चदशी – *Pañcadaśī*

As the three Gunas Sattva, Rajas and Tamas are inseperable, even the Tamas-ridden Root-cause has inherent in its all the three Gunas. The elements createdout of this Root-cause must also have in them all these three Gunas.

From the same Sattva aspects but collectively taken up arises the inner instrument which is called Mind when it is cogitating and the intellect when it determines. It is because of this collective nature, it is able to record all the sensations had severally through the varying senses.

Similarly, from Rajas aspects of the Five Elements considered individually arise the faculties of action. From the same collectively arises Prāṇa and life principles.

Prāṇa the product of Rajas aspects collectively considered is five-fold according to the variations in its functions.

तैः सर्वैः सहितैः वृत्तिमेदात् स पञ्च्धा।
प्राणोऽपानः समानश्चोदानव्यानौ च् ते पुनः॥

Taiḥ sarvaiḥ sahitaiḥ vṛttimedāt sa pañcdhā|
prāṇo'pānaḥ samānaścodānavyānau c te punaḥ||

(Pañcadaśī, Ch: 1, V: 22)

"From all of them together is born *Prāṇa*. Due to the difference in functioning, it is five-fold. They are *prāṇa, apāna, samāna, udāna* and *vyāna*"

The five factors herebefore as described, namely the five faculties of sensation, the five facultiess of action, the five aspects of Prāṇa, the mind and the intellect, in all, seventeen in number, make up the subtle body also called Linga Sarira.

बुद्धिकर्मेन्द्रियप्राणपञ्चकैः मनसा धिया ।
शरीरं सप्तदशभिः सूक्ष्मं तल्लिङ्गमुच्यते ॥

Buddhikarmendriyaprāṇapañckaiḥ manasā dhiyā|
śarīraṁ saptadaśabhiḥ sūkṣmaṁ talliṅgamucyate||

The subtle body is made up of the 17 factors, namely the five senses of perception, the five faculties of action, the five *Prāṇas*, the mind and the intellect. It is also called Linga.

(Pañcadaśī, Ch: 1, V: 23)

Tantras

हठयोगप्रदीपिका - *Haṭhayogapradīpikā*

चले वातं चलं चित्तं निश्चले निश्चलं भवेत् ।
योगी स्थाणुत्वमाप्नोति ततो वायुं निरोधयेत् ॥

Cale vātaṁ calaṁ cittaṁ niścale niścalaṁ bhavet|
yogī sthāṇutvamāpnoti tato vāyuṁ nirodhayet||

Respiration being disturbed, the mind becomes disturbed. By restraining respiration, the Yogi gets steadiness of mind. Hence one should restrain one's breath.

(Haṭhayogapradīpikā, Ch: 2, V: 2)

यावद्वायुः स्थितो देहे तावज्जीवनमुच्यते ।
मरणं तस्य निष्क्रान्तिस्ततो वायुं निरोधयेत् ॥

Yāvadvāyuḥ sthito dehe tāvajjīvanamucyate |

maraṇaṁ tasya niṣkrāntistato vāyuṁ nirodhayet ||

So long as the (breathing) air stays in the body, it is called life. Death consists in the passing out of the (breathing) air. It is, therefore, necessary to restrain the breath.

(Haṭhayogapradīpikā, Ch: 2, V: 3)

मलाकुलासु नाडीषु मारुतो नैव मध्यगः।

कथं स्यादुन्मनीभावः कार्य-सिद्धिः कथं भवेत्॥

Malākulāsu nāḍīṣu māruto naiva madhyagaḥ |

kathaṁ syādunmanībhāvaḥ kārya-siddhiḥ kathaṁ bhavet ||

The breath does not pass through the middle channel (Susumna), owing to the impurities of the Nadis. How can then success be attained, and how can there be the unmani avastha.

(Haṭhayogapradīpikā, Ch: 2, V: 4)

शुद्धमेति यदा सर्वं नाडी-चक्रं मलाकुलम्।

तदैव जायते योगी प्राण-सङ्ग्रहणे क्षमः॥

Śuddhameti yadā sarvaṁ nāḍī-cakraṁ malākulam |

tadaiva jāyate yogī prāṇa-saṅgrahaṇe kṣamaḥ ||

When the whole system of the Nadis which is full of impurities, is cleaned, then the Yogi becomes able to control the *Prāṇa*.

(Haṭhayogapradīpikā, Ch: 2, V: 5)

यदा तु नाडी-शुद्धिः स्यात्तथा चिह्नानि बाह्यतः।

कायस्य कृशता कान्तिस्तदा जायते निश्चितम्॥

Yadā tu nāḍī-śuddhiḥ syāttathā cihnāni bāhyataḥ |

kāyasya kṛśatā kāntistadā jāyate niścitam ||

When the Nadis become free from impurities, and there appear the outward signs of success, such as lean body and glowing color, then one should feel certain of success.

(Haṭhayogapradīpikā, Ch: 2, V: 19)

यथेष्टं धारणं वायोरनलस्य प्रदीपनम्।

नादाभिव्यक्तिरारोग्यं जायते नाडि-शोधनात्॥

Yatheṣṭaṁ dhāraṇaṁ vāyoranalasya pradīpanam |
nādābhivyaktirārogyaṁ jāyate nāḍi-śodhanāt ||

By removing the impurities, the air can be restrained, according to one's wish and the appetite is increased, the divine sound is awakened, and the body becomes healthy.

(Haṭhayogapradīpikā, Ch: 2, V: 20)

घेरण्ड संहिता - *Ġheraṇḍa Saṁhitā*

Basic rules of *Prāṇayama*

अथातः संप्रवक्ष्यामि प्राणायामस्य सद्विधिम्।

यस्य साधनमात्रेण देवतुल्यो भवेन्नरः॥

Athātaḥ sampravakṣyāmi prāṇāyāmasya sadvidhim|
yasya sādhanamātreṇa devatulyo bhavennaraḥ||

Now I shall expound the correct rules of *Prāṇayama*. By its practice alone a man becomes God-like.

(Ġheraṇḍa Saṁhitā, Ch: IV, V: 1)

आदौ स्थानं तथा कालं मिताहारं तथापरं।

नादिशुद्धिं ततः पश्चात्प्राणायामं च साधयेत्॥

ādau sthānaṁ tathā kālaṁ mitāhāraṁ tathāparaṁ|
nādiśuddhiṁ tataḥ paścātprāṇāyāmaṁ ca sādhayet||

First of all (one should look to) these things – Suitable place and time, wholesome food in moderation and purification of the Nadies and after that begins the practice of Prāṇayama.

(Ġheraṇḍa Saṁhitā, Ch: IV, V: 2)

हठरत्नावली - *Haṭharatnāvalī*

मकारेण मनः प्रोक्तं त्रकारः प्राण उच्यते।

मनः प्राणसमायोगाधोगो वै मंत्रसंज्ञकः ॥१९॥

Makāreṇa manaḥ proktaṁ trakāraḥ prāṇa ucyate|
manaḥ prāṇasamāyogādhogo vai mantrasañjñakaḥ||19||

The letter 'Ma' is for Manas (mind) and thte letter 'Tra' is said to be for *Prāṇa*. By connecting Manas and *Prāṇa* the yoga is called Mantra yoga.

(Haṭharatnāvalī, Ch:1, V: 19)

अथ प्राणयामः - *Atha Prāṇayāmaḥ*

अथासने द्रढे योगी वशी हितमिताशनः।

गुरुपदिष्टमार्गेण प्राणायामान्ससमभ्यसेत् ॥७८॥

Athāsane draḍhe yogī vaśī hitamitāśanaḥ|
gurupadiṣṭamārgeṇa prāṇāyāmānsasamabhyaset||78||

After becoming well versed in Asana, the yogi with his senses under control and eating moderate agreeable food should practice *prāṇāyāma* as advised by Guru.

(Haṭharatnāvalī, Ch:3, V: 78)

चले वाते चलं सर्व निश्चले हठबन्धनम् ॥७९॥

Cale vāte calaṁ sarva niścale haṭhabandhanam||79||

When Vata (air) is not steady, everything is not steady. When vata becomes steady, then only mastery on Hatha is acquired.

(Haṭharatnāvalī, Ch:3, V: 79)

यावद्वायुः स्थितो देहे तावज्जीवितमुच्यते।

मरणं तस्य निष्क्रान्ते ततो वायुं निरोधयेत् ॥८१॥

Yāvadvāyuḥ sthito dehe tāvajjīvitamucyate|
maraṇaṁ tasya niṣkrānte tato vāyuṁ nirodhayet||81||

There is life so long as Vayu is working in the body. Vayu ceasing to work means death. Therfore, respiration should be regulated (so as to minimize respiratory activity).

(Haṭharatnāvalī, Ch:3, V: 81)

ब्रह्मोदयोऽपि त्रिदशाः पवनाभ्यासतत्पराः ।

अभूवन्न्तकभयात्तस्मात्पवनमभ्यसेत् ॥८३ ॥

Brahmodayo'pi tridaśāḥ pavanābhyāsatatparāḥ|
abhūvannntakabhayāttasmātpavanamabhyaset||83||

Even Brahmadeva and the other Gods devoted themselves to the practice of *prāṇāyāma* as they geared death. Hence one should practice *prāṇāyāma*.

(Haṭharatnāvalī, Ch:3, V: 83)

सिद्धे वा बद्धपद्मे वा स्वस्तिकेवाभवासने ।

ऋजुकायः समासीनः प्राणायामान्समभ्यसेत् ॥८४ ॥

Siddhe vā baddhapadme vā svastikevābhavāsane|
ṛjukāyaḥ samāsīnaḥ prāṇāyāmānsamabhyaset||84||

Prāṇāyāma should be practice in Siddhasana, Baddha-pamasana or Swastikasana, sitting on level ground with the body erect.

(Haṭharatnāvalī, Ch:3, V: 84)

प्राणायामेन युक्तेन सर्वरोगक्षयो भवेत् ।

आयुक्ताभ्यासयोगेन सर्वरोगसमुभ्दवः ॥९२ ॥

Prāṇāyāmena yuktena sarvarogakṣayo bhavet|
āyuktābhyāsayogena sarvarogasamubhdavaḥ||92||

By proper practice of *prāṇāyāma*, all diseases are annihilated. Improper practice of *prāṇāyāma* (on the other hand) gives rise to all sorts of diseases.

(Haṭharatnāvalī, Ch:3, V: 92)

युक्तं युक्तं त्यजेद्वायुं युक्तं युक्तं च पूरयेत् ।

युक्तं युक्तं च बध्नीयात् एवं सिद्धिमवाप्नुयात् ॥९४ ॥

Yuktaṁ yuktaṁ tyajedvāyuṁ yuktaṁ yuktaṁ ca pūrayet|
yuktaṁ yuktaṁ ca badhnīyāt evaṁ siddhimavāpnuyāt||94||

One should exhale, retain and inhale in a regulated manner and should in this way attain success in *prāṇāyāma.*

(Haṭharatnāvalī, Ch:3, V: 94)

(Smratīs)

श्रीमद्भगवद्गीता ॥ – *Śrīmadbhagavadgītā* ||

अपाने जुह्वति प्राणं प्राणेऽपानं तथापरे ।

प्राणापानगती रुद्ध्वा प्राणायामपरायणाः ॥

Apāne juhvati prāṇaṁ prāṇe'pānaṁ tathāpare ।
prāṇāpānagatī ruddhvā prāṇāyāmaparāyaṇāḥ ||

Some are engaged in controlling the breathing process by breathing in (*Prāṇa*), then stopping the breath for a while (called in-Kumbhak) before breathing out (Apana) and then stopping the breath after breathing out (called out-Kumbhak) using yogic breathing techniques.

(Śrīmadbhagavadgītā, Ch: 4 V: 29)

How all five *Prāṇa* and five sub *Prāṇa* merge into chief *Prāṇa*?

The five sub-*Prāṇa* and the other *Prāṇa* are merged in the chief *Prāṇa* by the practice of *Prāṇa*yama. When the *Prāṇa* is controlled, the mind is also stops its wanderings and becomes steady; the senses are also thinned out and merge in to *Prāṇa*. It is through vibration of *Prāṇa* that the activities of mind and the senses are kept up. If the *Prāṇa* is controlled, the mind, the intellect and the senses cease to function.

पातञ्जलयोगसूत्राणि – *Pātañjalayogasūtrāṇi*

तस्मिन्सति श्वासप्रश्वासयोर्गतिविच्छेदः प्राणायामः ॥

Tasminsati śvāsapraśvāsayorgativicchedaḥ prāṇāyāmaḥ ||

Restraining the natural course or rhythm of inhalation and exhalation in a resolute position after completely overcoming the shakiness of body and withholding the motion of breaths with a special skill for acquiring a capability of expanding the dimensions of Prāṇa that is manifested through their medium to reach beyond the realm of body, this proficiency is termed as *Prāṇayam*.

(Pātañjalayogasūtrāṇi, Ch: 2, V: 49)

"*Prāṇayama* is control of Breath". "*Prāṇa*" is Breath or vital energy in the body. On subtle levels *Prāṇa* represents the *Prāṇic* energy responsible for life or life force, and "*ayama*" means control. So *Prāṇayama* is "Control of Breath". One can control the rhythms of *Prāṇic* energy with *Prāṇayama* and achieve healthy body and mind. *Patanjali* in his text of Yoga Sutras mentioned *Prāṇayama* as means of attaining higher states of awareness; he mentions the holding of breath as important practice of reaching Samadhi.

यथेष्टं धारणं वायोरनलस्य प्रदीपनम्।
नादाभिव्यक्तिरारोग्यं जायते नाडिशोधनात्॥९६॥

Yatheṣṭaṁ dhāraṇaṁ vāyoranalasya pradīpanam|
nādābhivyaktirārogyaṁ jāyate nāḍiśodhanāt||96||

By purifying the Nadis one is able to retain breath with ease; the gastric fire is increased and experience of (internally aroused) sound and good health are secured.

(Haṭharatnāvalī, Ch:3, V: 96)

अत्र शिववचनम् - *Atra Śivavacanam* (Here Shiva also says)

प्राणायाम परो योगी सोऽपि बिष्णु महेश्वरः।
सर्वदेवमयो योगी तस्यावज्ञां न कारयेत्॥९८॥

Prāṇāyāma paro yogī so'pi biṣṇu maheśvaraḥ|
sarvadevamayo yogī tasyāvajñāṁ na kārayet||98||

One who has mastered *prāṇāyāma* is like Vishnu and Maheshvara. That yogi is like all the Gods. Therefore, he should never be destroyed.

(Haṭharatnāvalī, Ch:3, V: 98)

2.9 CONCLUSION

The present study has compiled the authentic description and explanations of *Prāṇa* and *Prāṇayama kośa* from various traditional Yoga texts. These texts are eight of major *Upaniṣad*, *Smratīs* such as *Śrīmadbhagavadgītā*, *Yogavāsiṣṭhaḥ* and *Pātañjalayogasūtrāṇi*, *Śāstrās* such as *Vedānta-sāra*, *Pañcīkaraṇam* and *Pañcadaśī*, and *Tantras*, *Haṭhayogapradīpikā*, *Ġheraṇḍa saṁhitā* and *Haṭharatnāvalī* have been referred and presented with descriptions of *Prāṇa* and *Prāṇayama kośa*. The next step was to test the presence of *Prāṇa* and its dynamism in living and non-living things by conducting an experiment known as phantom leaf effect.

2.10 MEASURING *PRĀṆA*

1. **LITERATURE SURVEY (KIRLIAN PHOTOGRAPHY)**

Kirlian photography is named after a Russian technician Semyon Kirlian who noticed the florescence of his own fingers, when he was repairing high frequency equipment in a hospital in 1939. Kirlian photography is a photographic techniques used to capture the occurrence of electrical coronal discharge (Korotkov, 2002b). In other words, if an object is exposed to a photographic plate which is connected to a high-voltage source, it produces a discharge producing an image on the photographic plate (Hubacher, 2015). Photographing this information is known as Kirlian photography. This technique has evolved with various names over period of time, as "electrography", "electrophotography", "corona discharge photography" (CDP), "bio-electrography", "gas discharge visualization (GDV)", "electrophotonic imaging (EPI)", and, in Russian literature, "Kirlianography" (Boyers, 1973; Korotkov, 2002b).

2. **PHANTOM LEAF EFFECT**

The phantom leaf effect as appeared through Kirlian photography may help us to better understand the existence of subtle energies known as Chi/Prāṇa.

The phantom leaf effect is well known as the photographic recordings of a leaf as a whole and after cutting away a large portion of the leaf, using corona discharge imaging or Kirlian photography (Hubacher, 2015). The resultant image of the cut leaf meticulously resembles the original intact leaf including the amputated section. This phenomenon takes place when the leaf is put on a high-voltage electric plate.

Then ionization of the air molecules surrounding the object takes place, emitting light which is recorded directly onto light sensitive film. These photographs appear in such details that spine, veins and skin of the absent portion are readily apparent (Pace & Drumm, 1992). The phantom photography was initiated in the beginning of 1970s. It was originally described by Adamenko, and by Ostrander and Schroeder in 1970 (Hubacher, 2015) and reported by Tiller in 1973. Following these, there have been many research experiments on phantom leaf effect and published in various journals.

But more sophisticated findings have come from a recent study on the phantom leaf effect (a replication), conducted by John Hubacher on 137 leaves from various plants. The findings showed that ninety six phantom leaf specimens were successfully obtained; 41 specimens did not yield the phantom leaf effect. The study concluded that the phantom structure possibly evidence of the biological field can persist in the area of an amputated leaf section, and corona discharge can occur from this invisible structure (Hubacher, 2015).

3. CRITICAL ANALYSIS

Phantom Leaf Effect has been claimed and disclaimed as well by many over the decades. It has been claimed that using Kirlian photography, researchers and scientist could registered such a phenomenon called Phantom Leaf effect (Pace & Drumm, 1992). Whereas, disclaimed that the phantom leaf effect as projected by the picture is of the moisture. This moisture is left out on the glass plate after registering whole leaf. This hypothesis have been retested by Dr. Bill Joines, electrical engineering professor at Duke University, USA. He said that he and his fellow experimenters were able to replicate the phantom leaf effect with Kirlian photography. However, to check whether that image showing phantom leaf effect was true or just the result of moisture, they then did the experiment again, carefully wiping away any moisture that the original whole leaf would have left on the plate. With the moisture wiped away, the phantom leaf effect did not occur. Because of this experiment, Joines does not believe in the occurrence of phantom leaf effect.

Available literature is an evidence showing that phantom leaf is a result of the moisture. This, thus need to be investigated. Keeping this in mind we aimed at to investigate whether this PL effect is of moisture effect or real PL effect using Electro Photonic technique (EPI) which is an advance version of Kirlian photography.

4. AIM

A) To find out whether phantom leaf effect is moisture effect,

B) To test the subtle energy dynamics in live leaves,

C) To investigate whether the living leaves, dead dry leaves and dead wet leaves display effects of Prāṇa.

5. OBJECTIVES

To investigate

- Whether phantom leaf effect occurs from moisture or from some subtle energy,

- Whether living leaves have different electro photonic emission compared to dead dry leaves,
- Whether living leaves have different emission compared to wet dead leaves,
- Whether live leaves have reduced electro photonic emission with respect to time,
- To track the electro photonic emission spectrum with respect to different time intervals in intact, 25% and 75% cut leaves.

6. NULL HYPOTHESIS – (H_o)

1. H_o = the phantom leaf effect is an outcome of moisture,

2. **H_o** = the living leaves have no different electro photonic emission compared to dead dry leaves,

3. H_o = the living leaves have no different emission compared to dead wet leaves,

4. **H_o** = the live leaves do not have reduced electro photonic emission with respect to time,

5. H_o = the electro photonic emission spectrum does not vary with respect to time different intervals in intact, 25% and 75% cut leaves.

7. MATERIAL AND METHODS

MATERIALS

The study was conducted using Electrophotonic Imaging technique (EPI) which is basically based on coronal electrical discharge surrounding an object when exposed to a high electrical field (Lee et al., 2005). This utilizes high voltage of 10 kV at a frequency of 1024 Hz and low current that is in micro Amperes (Ciesielska et al., 2010). In particular, when any object is placed on a dielectric glass plate of the EPI, high electrical field is generated and this causes collision of electrons from the objects with the surrounding air molecules. These wrenched out electrons induce ionization of the air molecules and produce a glow around the object. Further, this phenomenon can be photographed and video graphed as well by a charged coupled device (CCD) camera placed beneath the glass plate (Hacker et al., 2005).

PLANT LEAF

To carry out the experiment, healthy live leaves in a flower pot and dry dead leaves were chosen. We used four different species of plants for the experiment. Experiment was conducted in a research lab to which flowerpots and dry dead leaves were brought.

8. DESIGN

1. Whole leaf versus cut leaf videos

2. Live leaf versus dead leaf and dead wet leaf videos

1. Whole leaf versus cut leaf videos –

A whole leaf (still attached to the plant) was tested with the time intervals of O minute, 1 minute, 2 minutes, 3 minutes, 5 minutes and 10 minutes.

Then 25% of the leaf was cut off the earlier leaf and the experiment was repeated as above,

Furthermore, 75% of the leaf was cut off and the experiment was repeated as above.

(This experiment was repeated 3 times).

2. Dead leaf versus live leaf videos – In this study, first live leaf was tested with the following time intervals of O minute, 1 minute, 2 minutes, 3 minutes, 5 minutes and 10 minutes.

Then a dead dry leaf from the same plant was tested with the same time intervals.

Furthermore, dead leaf was put in water for about 5 minutes to wet it and then this wetted leaf was tested following the same time interval as mentioned above.

(The entire experiment was repeated 3 times).

Placement of leaves for photography

A live leaf attached with its plant was placed on the dielectric plate of EPI. Dorsal side of the leaf was touching to the glass plate and then covered by an insulator put on top of the leaf. An electrode for grounding was attached to the stem of the leaf. Further, electric plate and leaf were covered properly from top to avoid any external light to enter inside. Then the EPI was activated to supply a short electric pulse to the glass plate and photographed by CCD camera.

9. OBSERVATIONS

Experiment -1: Whole leaf and cut leaves (with and without moisture))

Figures 2, 3 and 4: First the whole leaf was video graphed for 5 seconds continuously, the leaf exhibited complete picture. Then the same leaf was cut about 50% and pulled back a little to keep some moisture of the cut leaf on the glass plate. This moisture hence could be seen through videography as demonstrated in Figure-3. This is what has been misunderstood as a phantom leaf effect earlier. Further, the moisture was wiped away and it was video graphed again then the leaf did not demonstrate emission in the absent leaf portion (Figure-4).

Figure-2, whole leaf

Figure -3, cut leaf with moisture

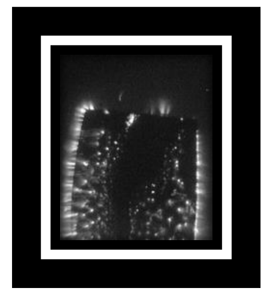


Figure -4, cut leaf without moisture

Experiment 1.1 (**Whole leaf versus cut leaf videos**)

1. The first observation was seen in the form of decreasing photonic emission at various time intervals of '0 minute', '1 minute', '2 minutes', '3 minutes', '5 minutes' and '10 minutes' in all experiments of whole intact leaf, 25% cut leaf and 75% cut leaf as well. The results were reproduced three times.

Experiment 2 (**Live leaf versus dead leaf and dead wet leaf videos)**

1. The observation for whole live leaf was similar as in experiment 1. The dead leaf measurements did not show electro photonic emission. However, the electro photonic emission from dead wet leaf showed constant emission in 6 measurements

on a set of ‘0 minute’, ‘1 minute’, ‘2 minutes’, ‘3 minutes’, ‘5 minutes’ and ‘10 minutes’ intervals.

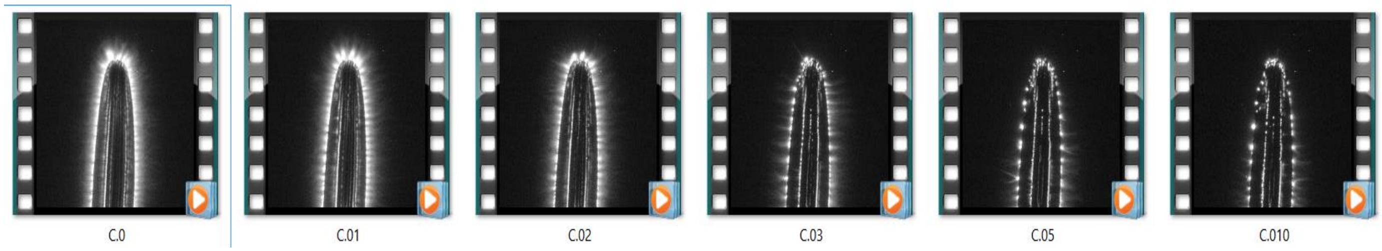


Figure -5, whole live leaf with time intervals of ‘0 minute’, ‘1 minute’, ‘2 minutes’, ‘3 minutes’, ‘5 minutes’ and ‘10 minutes’

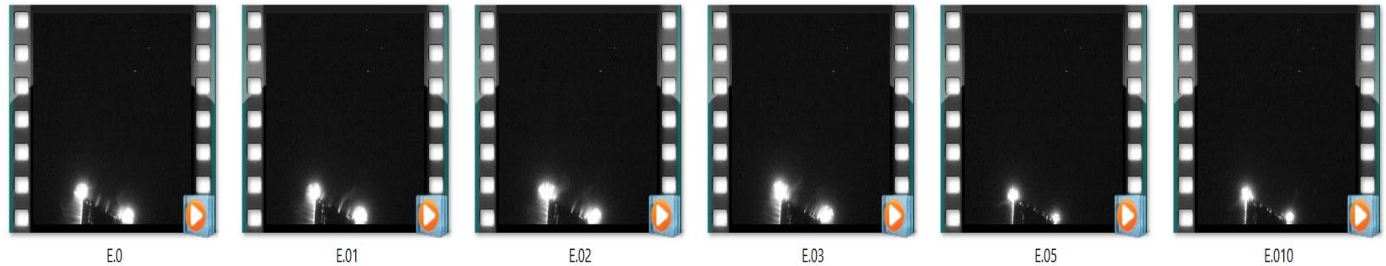


Figure -6, 75% cut live leaf with time intervals of ‘0 minute’, ‘1 minute’, ‘2 minutes’, ‘3 minutes’, ‘5 minutes’ and ‘10 minutes’

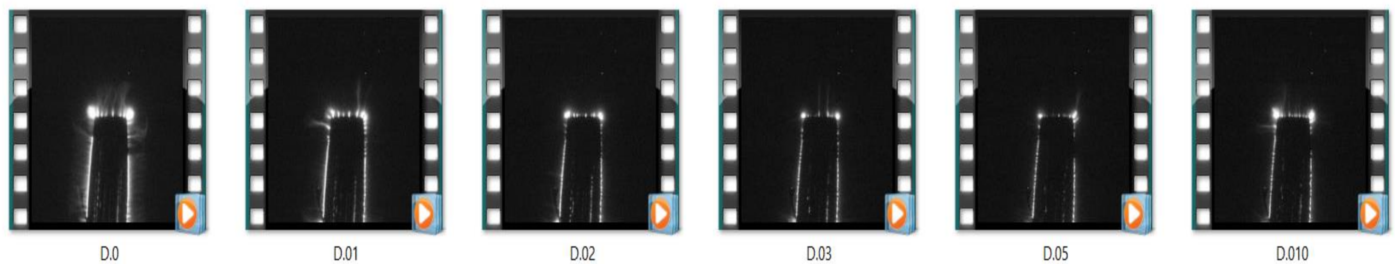


Figure -7, 25% cut live leaf with time intervals of ‘0 minute’, ‘1 minute’, ‘2 minutes’, ‘3 minutes’, ‘5 minutes’ and ‘10 minutes’

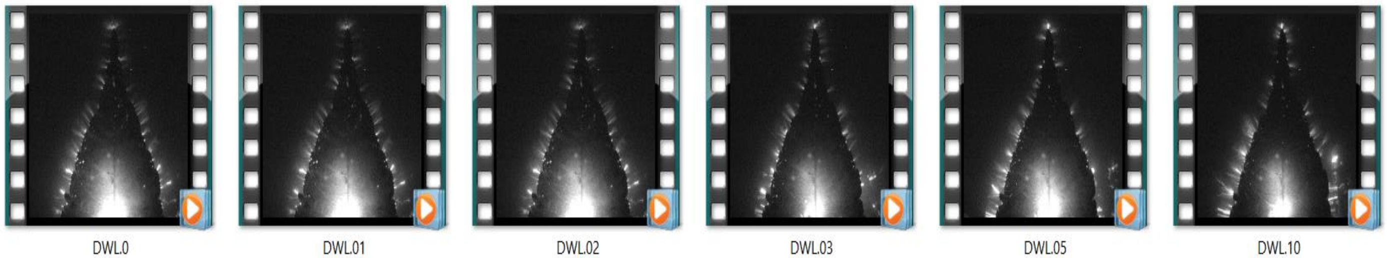


Figure -8, Dead wet leaf with time intervals of '0 minute', '1 minute', '2 minutes', '3 minutes', '5 minutes' and '10 minutes'

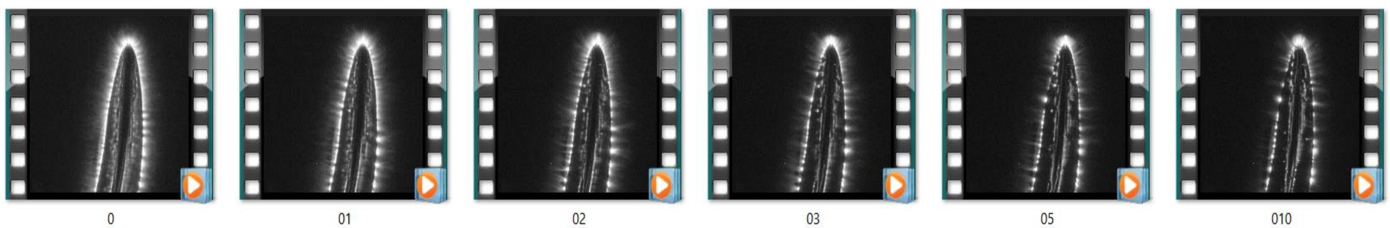


Figure -9, Live leaf with time intervals of '0 minute', '1 minute', '2 minutes', '3 minutes', '5 minutes' and '10 minutes'

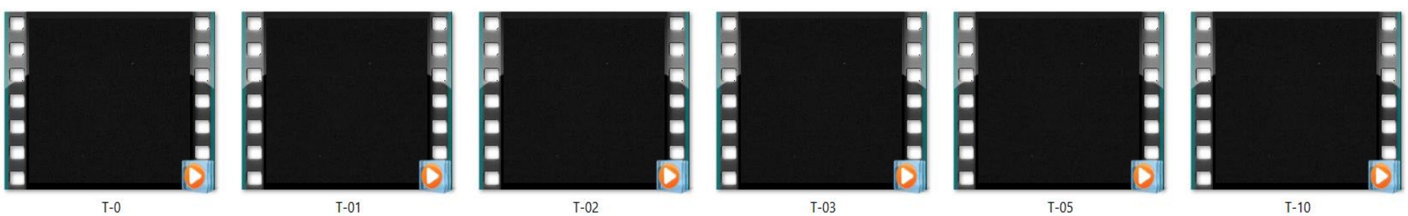


Figure -10, Dry dead leaf with time intervals of '0 minute', '1 minute', '2 minutes', '3 minutes', '5 minutes' and '10 minutes'

10. DISCUSSION

First experiment to test the phantom leaf effect showed moisture effect when induced moisture was video graphed, whereas when moisture was wiped away, the absent portion of the leaf – both 25% cut and 75% cut area – did not show any emission.

In other experiment, there was a decreasing trend of electro photonic (EP) emission on various time intervals of ‘0 minute’, ‘1 minute’, ‘2 minutes’, ‘3 minutes’, ‘5 minutes’ and ‘10 minutes’ from live leaves of three sets, whole intact leaves, 25% cut leaves and 75% cut leaves. The dead dry leaf measurements did not show EP emission at these time intervals; whereas, this EP Emission from wet dead leaves was found constant in all 6 repeated measurements. These experiments were reproduced three times, and showed repeatable outcomes.

In an earlier study, Dr. Joines found that PLE occurs from the moisture (Jennifer, 2015). The observations in the present study are also similar to the previous study. Kirlian photography works on all objects due to the availability of electrons and water conductivity. Water, being a good conductor of electricity, gives rise to electrons which in their turn, creates the Kirlian aura. When first placing the intact leaf on the photographic film and then remove a part of it, it is the water residue that was left on the film which still conducts electricity and emit a corona discharge. If a leaf is cut initially and then placed on the glass plate, the PLE disappears due to non-availability of water molecules from the leaf in the cut area.

However, another study has demonstrated PLE, but this experiment was conducted using another method and not using the principle of Kirlian photography (Hubacher, 2015). In this study, the bottom electrode plate, consisting of a Plexiglas cover over copper, was not cleaned between pictures. Therefore, we suspect that in this study also, the PLE would have occurred from moisture artefact (possible confounder as have been noticed earlier and in the present study also) left on the electrode plate.

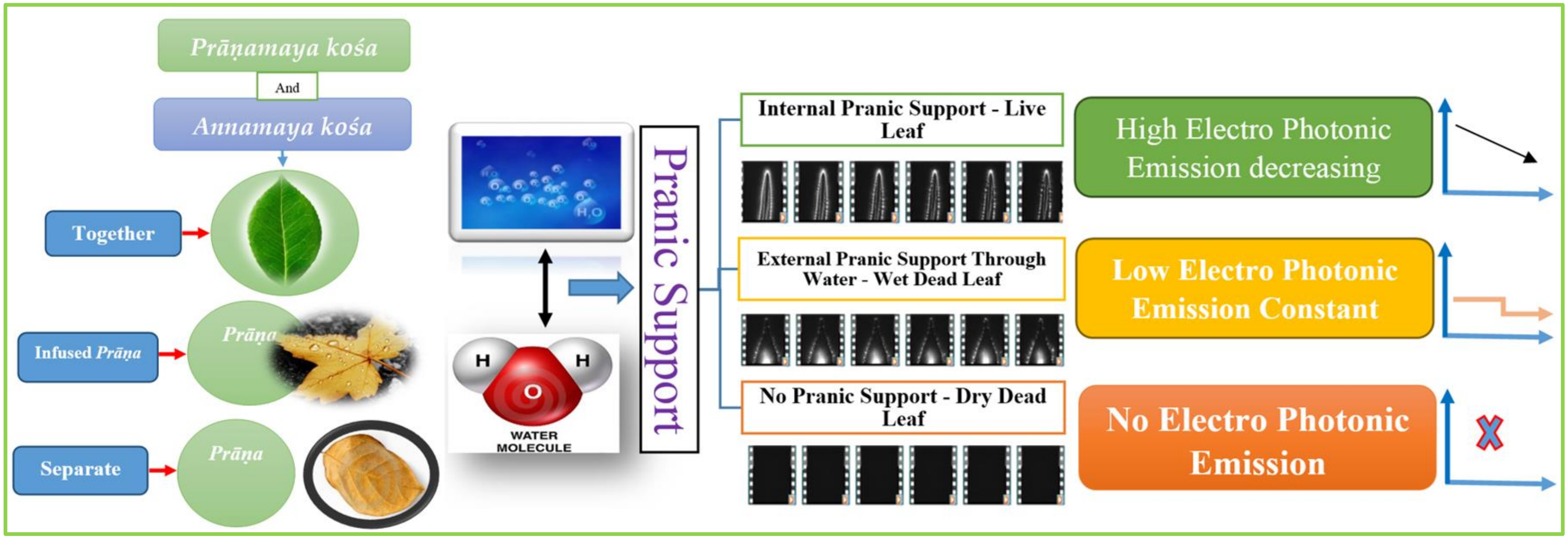
In the present study, we intended to investigate whether PLE is a moisture effect. And results showed when electrode plate is not cleaned after previous reading, the moisture emission was seen clearly, whereas when glass plate is wiped carefully, then PLE disappeared.

The other experiments in the present study looking at the time variability effect on the light emission in living, dry dead and wet dead leaves showed the importance of dynamic video images by EPI technique. In both live leaves and a wet dead leaves, the electrons were pulled out, and not in dry dead leaves. The difference between live system and a wet but dead system (leaf in this example) is the dynamic response of electrons. In a living system, there is a high EP emission at first reading and then decreasing trend of electrons availability with respect to time. Considering the above aspect, what is observe is a time dependent variation of EPI glow intensity in both cases. In the wet dead leaf however, the discharge and the image obtained has low and very steady emission, indicating absence of the dynamism seen in a living leaf. However, this emission phenomenon was completely absent in dry dead leaf.

It is to be noted that as per the theory of Ayurveda, *Prāṇa* is the subtlest part of water that we consume. Thus the importance of water in sustaining life processes. It is too early to say if the oxygen in water is involved in this process; it is possible that there is a strong possibility of this dependence. Thus, it is difficult to separate the effects of *Prāṇa* from that of water. If we wipe water off the leaf and the glass plate, it is likely we lose the availability of *Prāṇa* also. Thus water itself is a confounding aspect in these experiments. All that could be said at this time is that the dynamism seen in the EPI images in live system is an indication of dynamic nature of life itself. Thus it is difficult to repeat, for example, an acupuncture measurement for repeatability; even at short intervals of half a minute the life processes have slightly changed and this gives different outcomes in these subtle experiments.

Though EPI seems unable to distinguish between water and *Prāṇa*, it is designed on the principles of acupuncture; hence, its use in clinical evaluation of acupuncture activity – read activity of chi – is well accepted. This brings up another question: the equivalence of *Prāṇa* and Chi. Though most writers equate them as one and the same, it is thought by this author that they could be different. For example, we know now that chi has special channels known as Bonghan system (Soh, 2009), known after the discoverer of the channels through careful study of meridians. *Prāṇa* seems to course through *Nāḍīs*, again very subtle channels running throughout the body. These channels are still to be observed physiologically; only time will tell if specially designed instruments could make this possible.

Figure 11: Demonstrating Nature of *Prāṇa* in live and dead leaves



11. CONCLUSION

The experimental results show that the phantom leaf effect occurs mostly from moisture. The results also demonstrate that live leaves have a decreasing trend of electro photonic emission over a time interval whereas, this trend was not observed in wet dead leaves. Further, the dry dead leaves do not have EP emission. Moreover, from the experiments on live and dead leaves conducted in this study, it may be concluded that water content provides EPI images and *Prāṇa* could be the basis of subtle energy in the water molecules.

CHAPTER – 3.0

REVIEW OF SCIENTIFIC LITERATURE

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3.0 REVIEW OF THE SCIENTIFIC LITERATURE

3.1 A BRIEF HISTORY OF BIO-ELECTROGRAPHY

The very first discovery of occurrence of a ‘fluorescence’ or ‘glow’ from living and non-living objects came in 1777 when Professor Lichtenberg first time observed this florescence during investigation of electrical charges on an insulator surface that was covered with powder. Then about a century later, Nicola Tesla in (1880), demonstrated the same phenomenon from a human body. Later this florescence effect became known as ‘Lichtenburg figures’. Later on, Nardkevitch-Yodko of Russia in (1892), developed a method to study human energy state. On other side of the Earth, Catholic Priest, Father Landel de Morua of Brazil, developed an electrography camera. However, this method was restricted in its uses as it had some complexities and danger in using (Korotkov, 2002c).

3.2 KIRLIAN EFFECT

The discovery of electrography came then in existence worldwide, when Russian investigators, Semyon and Valentina Kirlian, also discovered the same phenomenon by 1939. This method of high frequency photography came to be known as Kirlian Effect. Then onwards, this method drew attention of many scientist and researchers worldwide. The Kirlian Effect is known as the resultant of an image of a gas discharge from an object when placed in high intensity electrical field and this outcome as an image is registered on some photo materials. When this technique is used to study biological subjects then it is referred as ‘bio-electrography’ and Kirlianography.

There onwards, the Kirlianography has been explored worldwide to conduct several experiments and investigations of various cases in the field of medicine. There are many references and published work using Kirlianography on biological subject's mainly human energy field (Korotkov, 2002b).

3.3 GAS DISCHARGE VISUALIZATION/ELECTRO PHOTONIC IMAGING TECHNIQUE (GDV/EPI)

About two decades ago in 1995, a Russian Scientist, Professor Konstantin Korotkov designed an instrument called Gas Discharge Visualization (GDV) which utilizes electro photonic imaging (EPI) technique. This was the time when analysis of electrophotonic imaging gained scientific status worldwide. The invention of EPI technique is on new scientific approach based, as it has digital video methods, modern electronics and computer system to process the data for analysis, though the base of it is same Kirlian effect (Korotkov, 2002b, 2011b). Using EPI technique, when any object (animate or inanimate), is exposed to a high electric filed (frequency of 1024Hz and voltage of 10 kV for less than a millisecond), then there happens excitation of electrons at the surface of the object. These excited electrons form ionization by interaction with surrounding gaseous molecules and results in a glow. And this phenomenon is known as electrophotonic emission, which is captured by Charged Coupled Device (CCD) camera (Hacker et al., 2005; Korotkov et al., 2004). In humans, this measurement is performed from all 10 finger tips. This provides overall picture of the body (*detailed information has been already mentioned in the introduction part*).

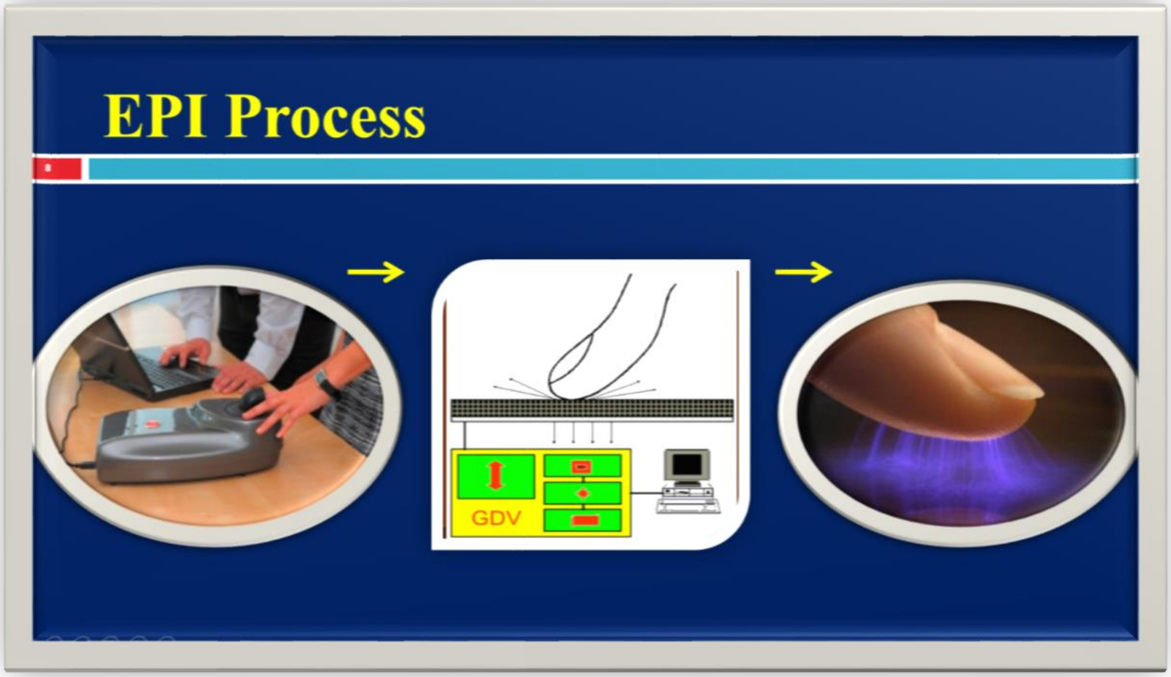

Figure -12: Demonstration of the Electro Photonic Imaging Process

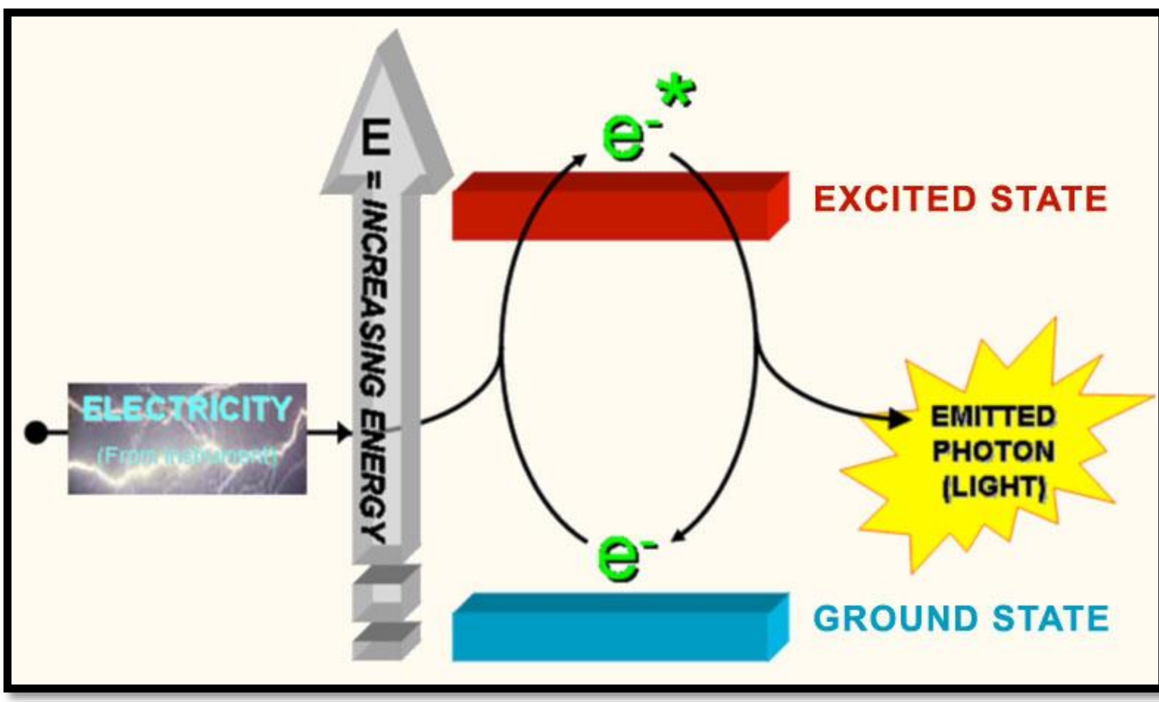

Figure-13: Demonstration of excitation of electrons and photonic emission using EPI technique

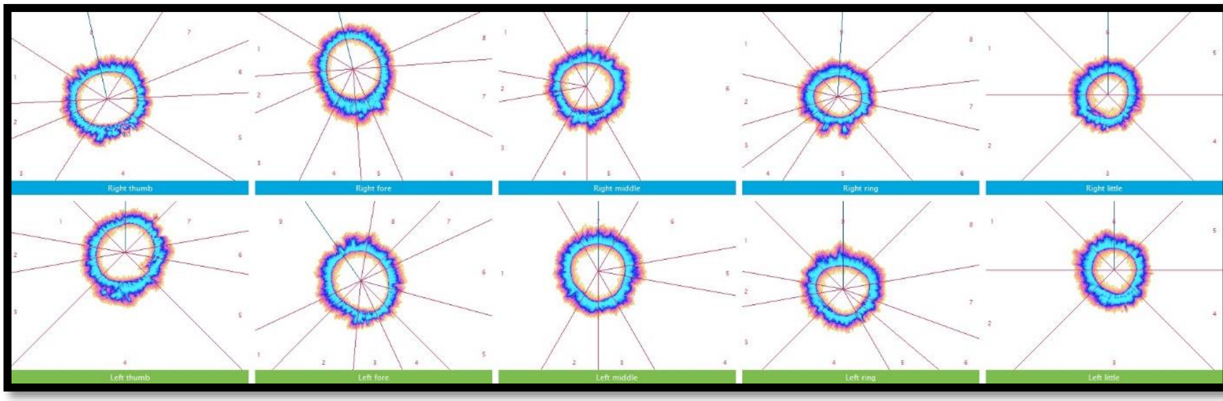

Figure -14: Demonstration of obtained electron photonic images from all 10 fingers using EPI technique

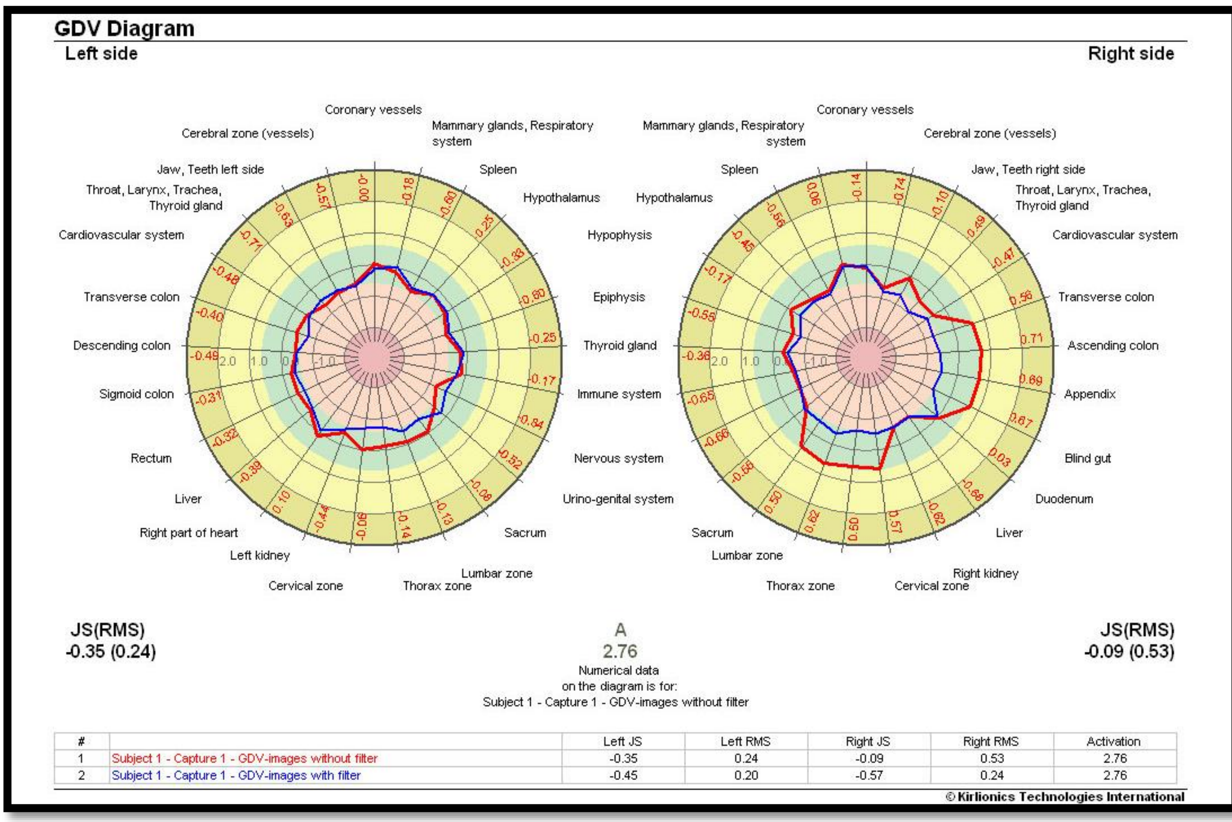

Figure -15: Demonstration of excitation of electrons and photonic emission using EPI technique

3.4 RECOMMENDED EPI MEASUREMENT PROCEDURE

To obtain reliable and reproducible data, it is recommended to follow an established guideline (Yakovleva & Korotkov, 2015a).

I. It is recommended to collect data after 3 h of food intake, without alcohol (approximately 24 hours of alcohol consumption) or strong medicines. Specific medicines like hormones or anti-depressants will have an effect on the energy levels. Subjects should be advised to empty the bladder and bowels before starting EPI readings.

II. Subjects must not wash or wipe their fingers using alcohol before measurements. If hands are dirty then wash but wait for another 15 minutes and then take measurements.

III. If hands are too sweaty, then wipe each finger individually and then take the measurements.

IV. Before the measurements let subjects be in a comfortable and pleasant surroundings for about 15 minutes.

V. No other diagnostic procedure should be held at the same time.

VI. In case of periodical monitoring the subjects, it is necessary that the EPI readings should be taken by the same expert, at the same place in a constant optimum temperature.

VII. There should be identical conditions of psychological and physical comfort for all subjects in a quiet and calm environment.

VIII. Calibration of EPI device should be performed routinely at least four times a year, or if conditions change, e.g. moving the camera to other site, change of computer, severe changes in atmospheric conditions. The calibration should also be done if results obtained are unusual.

IX. Subjects should place finger pads, one at a time, on the glass at 45° angles with a gentle but firm touch.

X. They should remove all metallic ornaments that they do not wear for the entire 24 hours.

XI. Subjects stand on an electrically isolated surface during measurements.

XII. The measurements should be taken first with the filter and then without filter. Use a new filter for each subject after readings of all 10 fingers.

XIII. Before each measurement the optic lens of the EPI device must be wiped clean.

XIV. If unusual EPI grams are obtained, it is advised to recapture the respective fingers to be sure of precise results.

XV. There should be ideal distance of three feet between EPI device and a dedicated laptop computer while collecting data.

XVI. Women in menstruation will affect the EPI results, therefore this factor should be kept in mind during assessments of females.

3.5 RELIABILITY AND VALIDITY OF EPI

Reproducibility of GDV/EPI data was addressed by Russo et al as early as in (2001) by quantitative analysis. They could demonstrate that most people who were assessed showed repeatability of more than 90%. But it was necessary to consider some factors such as physiological cycles and also the influence of emotions, alcohol, medications, and quality of sleep (Yakovleva & Korotkov, 2015a).

The reproducibility of GDV/EPI parameters' values was investigated for healthy people and bronchial asthma (BA) patients. This study demonstrated that EPI parameters in healthy individuals have an average variation of 4.1% when measured in a single day, whereas the average calculated when measurements were taken with 10 min interval was 6.6%. This variability in BA patients was respectively – 8.6% and 7.7%. This shows the high level of reliability of this technique (Korotkov, 2011c).

3.6 ADVANTAGES OF EPI

I. EPI system is so easy to use and all the analysis can be completely computer based. The system indicates itself if the images being registered are of acceptable quality,

II. EPI is non-invasive and safe to use technique,

III. It is an objective method of quick evaluation of health abnormalities in the human energy system,

IV. Simplicity and convenience of the method as measurement is performed from fingers only,

V. It provides quantitative information on the energy homeostasis level both for the organism as a whole and for individual functional systems,

VI. EPI system is relatively economic and the procedure itself does not involves any extra costs.

3.7 EPI ANALYSIS IN THE INTEGRATIVE MEDICINE

A. GDV/EPI in clinical areas

GDV/EPI technique has been utilized to screen and study various population worldwide such as bronchial asthma, hypertension, CVDs, cancer, pregnancy, autism and diabetes.

1. Bronchial Asthma

Comparisons of three different population, healthy people, patient with stomach and duodenum ulcer and bronchial asthma patient showed that the area parameter values of EPI for healthy people are always greater, as compared to that of unhealthy patients. For the BA group the EPI area is larger in proportion to greater severity cases, higher degrees of pulmonary obstruction and more pronounced dysfunctions of the microcirculation in the lungs. On the other hand, Emission coefficients (EC) parameter showed statistically different between the groups, as well, while fractal coefficients (FC and FrC) demonstrate less significant difference. The EPI-gram area in BA patients in the restorative phase after acute exacerbation is characterized by lower values of area indices and the integral area (IA) coefficient as compared to practically healthy people. IA values for healthy people were 0.56±0.35 on the left and 0.54±0.33 on the right side, whereas for BA patients 0.42±0.64 on the left and 0.51±0.69 on the right side (P=0.01) (Alexandrova et al., 2002).

2. Hypertension

Another study, investigating the potentials of Electrophotonic - Gas Discharge Visualization (EPC/GDV) analysis for detecting patients with arterial hypertension (AH) of different degree of severity in the course of population screening found reliable differences between healthy patients and groups with various degrees and stages of AH. This was calculated with sufficiently high accuracy and showed that Electrophotonic - Gas Discharge Visualization technique could be included in population screening (Aleksandrova, Zarubina, Kovelkova, Strychkov, & Yakovleva, 2011).

3. Cardiovascular Diseases (CVDs)

Another study, which was designed to assess changes in images of corona discharges (ICD) in patients with cardiovascular diseases (n=96) comparing with healthy people group (n=30), showed that age, gender, temperature in examination rooms as well as frame of mind of the study population exerted a similar effect on ICD in both groups. Heart rate, blood pressure and the pattern of coronary heart disease exerted varied effects on the patients' ICD parameters in the study group. It was concluded that the analysis of changes in ICD may be a source of information about the effect of physiological and pathophysiological changes in the human health state, both physical and mental (Ciesielska et al., 2010).

4. Cancer

Another study, looking at the EPI patterns between cancer patients (both breast and lung cancers) and healthy people had demonstrated significant statistical differences.

The study also showed that after treatment, EPI parameters shifted toward the "healthy" range of EPI. More specifically, the EPI sectors obtained from the tip of the little fingers' tip indicated to be the most representative one for the particular nosologies that correlates with ideas of Chinese meridians representation at the fingers (Yakovleva & Korotkov, 2015b).

5. Autism

A pilot study was conducted to assess the psycho-emotional and physiological functional state based on the activity of the autonomic nervous system in autistic children, siblings and their parents through a biometric device based on GDV technique. The results showed statistically significant differences on psycho-emotional and physiological levels between all compared groups. These differences between autistic children and controls on psycho-emotional level were found the most significant as compared to other groups. Therefore, it was interpreted that the activity of the sympathetic nervous system could have been significantly altered in children with autism (Kostyuk et al., 2010).

6. Diabetes

The recent study in India conducted by Sharma et al. in 2014 demonstrated that the two groups, namely T2DM and healthy subjects, have significantly different EPI pattern for cardiovascular, endocrine, immune and urogenital systems. Differences between diabetic and healthy groups showed increasing trend of EPI pattern with increase in duration of the disease. When dividing the diabetes group according to their pathological duration revealed systematic increases in values in all organs and organ systems. However, the study indicated that the existing EPI norms might be different for the Bangalore based population norms, and, hence, suggested that EPI norms for Indian population should be developed (Sharma, Hankey, & Nagendra, 2014).

B. Interventional studies using EPI

1. Stress reduction through osteopathy

GDV/EPI technique has been explored in various interventional studies, specifically looking at stress reduction and general health index. Such a study to explore how osteopathy treatments influence certain measurable aspects of the human biofield (various calculated parameters of finger corona discharge patterns) in healthy adults was conducted. Results demonstrated that most of the participants of these osteopathic treatments experienced increase in fingertip florescence area and average intensity, reduction in stress levels, and improved blood pressure measurements (Korotkov et al., 2012).

2. Music and EPI/GDV

A study exploring the influence of Indian devotional music on the human energy measured with EPI in the performers (singers and accompanists) of the music program and the audience found that EPI parameters area and intensity increased significantly and no significant decrease of the entropy in the students. However, the similar trend of the results was obtained in the singers and accompanists, though this was not significant (Rao, Kushwah, & Srinivasan, 2014).

Another study, exploring the effect of music and focused meditation on the human energy field using EPI showed that both interventions had a significant palliative effect on the EPI physiological measures. Data indicated a strengthening of the human energy field in area and brightness parameters of EPI (Gibson, 2004).

A study investigating the effect of anapanasati meditation on EPI parameters at physiological and psycho-physiological levels found significant changes in integral area with filter (physiological) in both right and left side and similar trends from without filter (psycho-physiological). There was reduction in activation coefficient (stress levels). Integral entropy (disorderliness) found decreased at psycho-physiological level on the left side, but not significant. However, integral entropy [IE] in the right side shifted towards higher values for without filter condition. However, the IE for both left and right sides with filter increased, but not significantly (Deo, Ravi, Srinivasan, & Kuldeep, 2015).

3.8 CYCLIC MEDITATION

In a yoga text, Mandukya Karika, there is a statement that suggests that a combination of both “calming” and “stimulating” measures may help in reaching a state of mental equilibrium. Such yoga practice, based on calming and stimulation effect, is known as Cyclic Meditation (CM). In an earlier study, CM was compared with another yoga practice that has only calming effect known as Shavasana (SH). The results showed a significant decrease in the amount of oxygen consumed and in breath rate and an increase in breath volume after both the (2-factor ANOVA, paired t test). However, the magnitude of change in these 3 measures was greater in CM. The results indicate: (1)

Oxygen consumption decreased 32.1% after CM compared with 10.1% after SH; (2) breath rate decreased 18.0% after CM and 15.2% after SH; and (3) breath volume increased 28.8% after CM and 15.9% after SH. The results found supportive to the statement that a combination of both “calming” and “stimulating” measures helps in reaching a state of mental equilibrium more than relaxation alone (Shirley Telles, Reddy, & Nagendra, 2000).

Later, a study conducted by Patil & Telles (2006) in 50 male volunteers found similar results showing a decrease in oxygen consumption (19.3%) after the practice of CM compared to SR (4.8%). These changes also suggested period of physiological relaxation which was more after CM compared to SR (Sarang & Telles, 2006).

Subramanya & Telles in (2009) conducted a study in 47 male volunteers and found that the latencies of neural generators corresponding to cortical areas is prolonged following CM, whereas a similar change occurs at mesencephalic-diencephelic levels following SR (Subramanya & Telles, 2009c).

Cyclic Meditation (relaxation techniques) improves memory scores and reduces anxiety immediately after the practice more than just following a supine rest. In 57 male volunteers, a study found a significant improvement in the scores of all sections of the Wechsler Memory Score (WMS) after both CM and SR; however, the magnitude of change was more after CM compared to after SR. Similarly, there was a decrease in state anxiety scores after both CM and SR, but, the magnitude of decrease was more after CM (Subramanya & Telles, 2009d).

Another study, investigating possible improvement in memory and selective attention through Digit Letter Substitution Task (DLST) in school students found that both CM and SR lead to improvement in memory and selective attention scores. However, there was more wrong cancellation errors in both the groups (Pradhan & Nagendra, 2009). The performance in a six-letter cancellation task in 69 male volunteers have been found improved immediately after CM compared with SR; this requires selective attention, concentration, visual scanning abilities and a repetitive response. The net scores were significantly higher in both the groups after the practice, but, the magnitude of change was more after CM than after SR (24.9% versus 13.6%). Further, the wrong cancellation score reduced in CM and not after SR. Hence this suggest that CM brings greater improvement in performance in this task (Sarang & Telles, 2007).

3.9 INTEGRATED YOGA MODULE

Chandwani, Perkins, & Nagendra et al., in (2014), found that IYM improved quality of life and physiological changes associated with radio therapy (XRT) beyond the benefits of simple stretching exercises in women with breast cancer, and these benefits appear to have long-term durability (Chandwani et al., 2014). Yoga practices have been found reducing anxiety, depression and pregnancy related uncomfortable experiences in normal pregnancy (Satyapriya, Nagarathna, Padmalatha, & Nagendra, 2013). Another study through a seven days of intensive residential Yoga Program in chronic low back pain patient reduced pain, anxiety, depression, and improves spinal mobility more effectively than physiotherapy exercises (Tekur, Nagarathna, Chametcha, Hankey & Nagendra, 2012). Another study, in 250 participants with osteoarthritis (OA) of knees, found that yoga therapy is better than physiotherapy exercises as an adjunct to transcutaneous electrical stimulation and ultrasound treatment in reducing pain, morning stiffness, state and trait anxiety, blood pressure and pulse rate in patients with OA (Ebnezar, Nagarathna, Yogitha, & Nagendra, 2012). The study compared two groups of yoga practitioners - 33 Novice and 20 experienced - found that Yoga lifestyle practice can increase and balance acumeridian energies; long-term practice decreases group SD's. Suggestions as to why yoga improves health were made; one, it increases *Prāṇa* levels; and the second is that it improves physiological regulation which is thought to be a key factor for health (Sharma, Hankey, Nagilla, Meenakshy, & Nagendra, 2014).

TABLE 3: SUMMARY OF SCIENTIFIC LITERATURE REVIEW

Author and year of Publication	Sample size (n)	Design	Variables studied	Findings
STUDIES USING GDV/EPI IN VARIOUS CLINICAL CASES				
Alexandrova et al. (2004)	247 bronchial asthma 56 healthy people	Cross sectional study	GDI background area, normalized area, integral area coefficient, emission coefficient, form coefficient, fractality coefficient	Patterns of GDV-grams of fingers from patients with bronchial asthma correlate with known main pathogenic identifiers, giving evidence of the clinical usefulness and informativeness of bioelectrography and its complementary role in clinical medicine.

Aleksandrova et al. (2011)	603 patients	Cross sectional study	image area, normalized area, intensity, spectrum width, brightness and fractality	Reliable differences between the control group (healthy patients) and groups with various degrees and stages of AH were calculated with sufficiently high accuracy.
Ciesielska et al. (2010)	126 subjects 96 patients with coronary heart disease 30 healthy persons.	Cross sectional study	corona discharges of fingertips of both hands, frame of mind, age, gender, heart rate, blood pressure, serum potassium concentration	Age, gender, temperature in examination rooms as well as frame of mind of the study population exerted a similar effect on ICD in both groups. Heart rate, blood pressure and the pattern of coronary heart disease exerted varied effects on the patients' ICD parameters in the study group.

Gagua et al. (2004)	109 Lung cancer, 140 Breast cancer, 44 practically healthy 54 different non-oncological conditions	Blind study design	Area, Entropy, Fractality, Form Coefficient and Brightness	Statistically significant difference between GDV parameters of oncology patients and non-oncology groups was found for all studied cases. After treatment statistical trend of GDV parameters towards healthy population parameters was revealed.
Kostyuk, Rajnarayanan, Isokpehi & Cohly (2010)	6 autistic participants, their parents and	Multiple group design (4 experimental and 1 control)	48 acupuncture points assessments at both psycho-emotional (images without filter) and	All compared groups have shown significant difference on both psycho-emotional (images without filter) and physiological (images with filter) levels. However, the

	siblings; 7 control and their parents		physiological (images with filter) levels.	differences between autistic children and controls expressed on psycho-emotional level were the most significant as compared to the other groups. Therefore, the activity of the sympathetic autonomic nervous system is significantly altered in children with autism.
Sharma, Hankey & Nagendra (2014)	138 T2DM people 84 healthy people	Two groups comparative design	GDV Screening, Diagram, and Right Left Symmetry	Significant differences were observed between the two groups in the cardiovascular, endocrine, immune and urogenital systems. Dividing the diabetes group according pathology duration revealed systematic increases in values in all organs and

				organ systems. Differences between diabetic and healthy groups increase with increasing duration of the disease. Population norms require further investigation.
INTERVENTIONAL STUDIES USING GDV/EPI				
Korotkov et al. (2012)	33 healthy subjects	Single group pre-test and post-test	EPI/GDV-gram image area, average intensity, and activation coefficient	There was increase in fingertip florescence area and average intensity, reduction in stress levels, and improved blood pressure measurements.

Rao, Kushwah & Srinivasan (2014)	12 students 5 singers and accompanists	A mixed method design	Area, intensity and entropy	GDV parameters- area and intensity - showed positive significant increase and the entropy was not significantly decreased in the students and though the change is not significant, the same trend is found in the singers and accompanists
Gibson (2004)	Total 49 subjects 19 healthy 30 unhealthy	repeated measures	POMS Total Score, POMS –Tension and POMS –Depression and Subjects Unites of Distress SUDS.	The GDV data indicates a strengthening of the human energy field in area and brightness and the POMS data demonstrates a significantly improved mood state.

			GDV Area, Brightness and Activation Coefficient	
STUDIES ON CYCLIC MEDITATION				
Telles, Reddy, & Nagendra, (2000)	40 Male volunteers	Self as controlled trial	Oxygen consumption, Breath rate And Breath volume	Oxygen consumption decreased 32.1% after CM compared with 10.1% after *Śavāsana*, Breath rate reduced by 3.6 c/min after CM, and by 1.9 c/min after SH whereas, Breath amplitude increased 28.8% after CM and 15.9% after SH.

Sarang, & Telles (2006)	50 male volunteers	Self as control design	Oxygen consumption, minute ventilation, tidal volume breath rate	Oxygen Consumption decreased 19.3 % after cyclic meditation and 4.8 % decrease after *Śavāsana*. The reduction in minute ventilation, tidal volume and breath rate was more after CM than SR.
Subramanya & Telles (2009)	47 male volunteers	Self as control design	Na - Latency (ms) Amplitude (µV) Pa - Latency (ms) Amplitude (µV) Nb - Latency (ms) Amplitude (µV)	The Pa wave peak latency and Nb wave peak latency significantly increased after CM. Peak amplitude of the Nb wave increased significantly after CM. Whereas, peak latency of the Na wave increased significantly after SR.

Subramanya & Telles (2009)	57 male volunteers	Self as control design	A) Sections of the Wechsler memory scale (WMS), 1. Attention and concentration (digit span forward and backward), and 2. Associate learning. B) State anxiety was	All sections of WMS studied improved significantly in both groups, but the magnitude of change was more after CM compared to after SR. The state anxiety scores found decreased after both CM and SR, with a greater magnitude of decrease after CM.
Pradhan & Nagendra (2009)	253 school students	Self as control design	Digit Letter Cancelation Task (DLST)	Pre-post improvement was found more significant after SR (7.85%) in comparison to CM (3.95%). The

				number of wrong attempts increased significantly after both CM and SR.
Sarang & Telles (2007)	69 volunteers	Self as control design	Six letter cancellation test (SLCT)	The net scores were significantly higher after both CM and SR, though the magnitude of change was more after CM than SR (24.9% versus 13.6%). The scores for wrong cancellations reduced after Cyclic Meditation and not after Supine Rest. The control group showed no change.
STUDIES THROUGH INTEGRATED YOGA MODULES				
Chandwani et al. (2014)	163 breast cancer patients	Randomized Controlled Trial	Self-report measures of QOL (Medical Outcomes Study 36-item short-form	YG improved QOL and physiological changes associated with XRT beyond the benefits of

			survey; primary outcomes), fatigue, depression, and sleep quality, and five saliva samples per day	simple ST exercises, and these benefits appear to have long-term durability.
Satyapriya, Nagarathna, Padmalatha, & Nagendra (2013)	96 pregnant women	Prospective Randomized control study	Pregnancy related experience (PEQ), State (STAI I) anxiety, Trait (STAI II) anxiety, Depression (HADS)	Pregnancy related experience (PEQ) reduced by 26.86% in YG, State anxiety decreased 15.65% in YG, increased 13.76% in CG, Trait anxiety decreased 8.97% in YG, increased 5.02% in CG and Depression (HADS) decreased 30.67% in YG, increased 3.57% in CG.

Tekur, Nagarathna, Chametcha, Hankey, & Nagendra (2012)	80 patients	randomized control single blind active study	pain; Anxiety; Depression and Mobility	Pain reduced significantly, 49% in YG, 17.5% in CG. State anxiety (STAI) reduced 20.4% and trait anxiety 16% in the YG. Depression (BDI) decreased 47% in YG and 19.9% in CG. Spinal mobility ('Sit and Reach' instrument) improved 50%, in YG and 34.6% in CG.
Ebnezar, Nagarathna, Yogitha, & Nagendra, (2012)	250 participants	A randomized control study	Anxiety, pain and stiffness	Resting pain and morning stiffness reduced better in YG than CG. State anxiety reduced by 35.5% (post 1) and 58.4% (post 2) in the YG and 15.6% (post 1) and 38.8% (post 2) in the CG. Trait anxiety reduced

				($P<0.001$) better (post 1=34.6% and post 2=57.10%) in YG than CG. Systolic blood pressure and Diastolic blood pressure reduced better in YG than the control group. Pulse rate reduced better in YG than the CG.

3.10 CONCLUSION

The Scientific literature review was done on Electro Photonic Imaging (EPI) technique related studies that have been used to screen various populations, mainly in clinical areas, and also its applications in alternative medicine related studies, and studies on Cyclic Meditation and studies through Integrated Yoga Module. This survey demonstrates the need for EPI norms for heathy Indian population and also the need of study to explore the effect of yoga based interventions on subtle energy levels, such as *Prāṇamaya Kośa* and *Manomaya Kośa* levels.

CHAPTER – 4.0

AIM AND OBJECTIVES

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4.0 AIMS AND OBJECTIVES OF THE STUDY

4.1 AIMS

To investigate the effect of Integrated Yoga Practices in healthy people using EPI.

4.2 OBJECTIVES

1. To establish normative data of electro photonic imaging (EPI) parameters for healthy Indian population, to aid in the accuracy of EPI measurements and interpretations.

2. To find out whether EPI norms differ based on gender.

3. To examine the effect of Cyclic Meditation on stress and health indices in managers as measured by EPI technique.

4. To study the stress, general health index and disorderliness in the human energy system through Integrated Yoga Module (IYM) using EPI technique.

4.3 RESEARCH QUESTION

1. Are EPI norms of healthy European population different from healthy Indian EPI norms?
2. Do EPI norms differ between males and females?
3. Can Cyclic Meditation practice improve EPI parameters?

4. Can Integrated Yoga Practices help in sustaining the energy levels in healthy people?
5. Can Integrated Yoga Practices improve EPI parameters in healthy people?

4.4 HYPOTHESES

H_a1: The Indian norms for EPI parameters Activation Coefficient, Integral Area and Integral Entropy will be different from European population.

H_a2: There will be significant difference in activation coefficient, integral area, left and right and integral entropy, left and right parameters between males and females.

H_a3: There will be significant change in activation coefficient, integral area, left and right and integral entropy, left and right parameters after Cyclic Meditation practice in managers.

H_a4: EPI parameters activation coefficient, integral area, left and right and integral entropy, will be different after Cyclic Meditation from after supine rest practice in managers.

H_a5: There will be significant improvement in activation coefficient, integral area on left and right sides and integral entropy, left and right parameters after four weeks of IYM in healthy volunteers.

4.5 NULL HYPOTHESES

H_o1a: The Indian norms for EPI parameters Activation Coefficient, Integral Area and Integral Entropy are similar to European population.

H_o2a: There will be no significant difference in activation coefficient, integral area, left and right and integral entropy, left and right parameters between males and females.

H_o3a: There is no change in activation coefficient, integral area, left and right and integral entropy, left and right parameters after Cyclic Meditation practice in managers.

H_o4a: EPI parameters activation coefficient, integral area, left and right and integral entropy, left and right are equal after Cyclic Meditation and Supine rest in both the groups in managers.

H_o5a: There will be no change in activation coefficient, integral area, left and right and integral entropy, left and right parameters after four weeks of IYM in healthy volunteers.

4.6 NEED AND SCOPE OF THE STUDIES

NORMATIVE STUDY

In the present scenario, all the research work and practices through EPI are utilizing the norms developed for European (EU) and Russian populations; however, the EPI norms for healthy Indian population are not available. From our practical observation, we anticipate that the norms for healthy Indian people may be different from the existing EPI norms for healthy EU population. Therefore, the present study focuses on the development of EPI normative data for healthy Indian population. This will enable and facilitate research work in India in various fields such as conventional practices, alternative medicine, and psycho-physiologic practice, psychology and consciousness studies, etc. Therefore, the current research work is undertaken to develop EPI norms for healthy Indian population.

YOGA BASED TECHNIQUE

Prevalence of stress in business executives is high. It is well establishing that CM based on stimulations followed by relaxation principle reduces sympathetic activity (Vempati & Telles, 2000) increases parasympathetic activity (Sarang & Telles, 2006) which is an indication of stress reduction. There are many methods to measure stress level both subjective and objective. EPI method has also been used to measure stress levels (Korotkov et al., 2012). Because of its multiple advantages, as non-invasive, objective, cost effective, time saving and easy method for quick health assessment, its clinical use could be profound.

INTEGRATED YOGA MODULE (IYM)

Yoga practice is recommended for prevention of diseases. IYM developed at SVYASA University has the components for aligning energies at all *Pañcakośa* levels. According to yoga philosophy, stress is a primary cause of diseases. Stress in *Manomaya Kośa* level leads to imbalances in *Prāṇamaya Kośa* level and over a period of time, it percolates to physical level manifesting in the form of diseases in energy imbalanced organs (Nagarathna & Nagendra, 2009). EPI method used to asses both psycho-physiological conditions and physiological conditions of a person at the time of investigation, gives us information of energy congestion in various organ (Korotkov et al., 2012). Such EPI technology which is non-invasive for quick health assessment of all physiological systems in couple of minutes is an ideal technique and no requirement of any other materials and laboratories costs. Thus the EPI technique could play an important role in prevention of diseases.

(*In the next chapter, we present the methods of conducting the experiments).*

CHAPTER – 5.0

METHODS

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5.0 METHODS

5.1 NORMATIVE STUDY PROTOCOL

SUBJECTS

Sample size calculation, $\alpha = 0.05$, Confidence level = 99%, Population Size = 20000, and response distribution = 50%. Estimated sample size was = 643. (http://www.raosoft.com/samplesize.html)

A total of 1297 volunteers were measured from December 2013 to December 2014, from different parts of India. Among them, 880 volunteers were reported to be healthy, (age M±SD, 33.55±10.92), with 584 males, (age M±SD, 33.54±10.86) and 296 females (age M±SD, 33.56±11.00). As the focus was to develop norms for healthy people, we did not include data of those with any self-reported ailments.

INCLUSION CRITERIA

The present study included only healthy Indian subjects of both genders, age range 18 to 60 years, and those who were willing to take part in the study.

EXCLUSION CRITERIA

The exclusion criteria were: any cut in fingers and/or absent fingers; subjects who had any self-reported health issues and if they had smoked or taken alcohol on the day of measurement.

5.2 CYCLIC MEDITATION VS SUPINE REST STUDY PROTOCOL

SUBJECTS

Sample size calculation:

Pilot study on n=20, $\alpha = 0.05$, $\beta = 0.95$, $d = 1.04$, estimated sample size n=42. (G*Power 3.0.10).

One hundred and fourteen managers participated in the study from a series of programs called self-management of excessive tension (SMET), which is conducted periodically at S-VYASA University, Bengaluru, India. All the subjects participating in the study were from 2 days of SMET program conducted for three companies in India viz., Hindustan Aeronautics Limited, Oil and Natural Gas Corporation Limited and Canara Bank.

INCLUSION

Age ranges 30–60 years, managers (having lifestyle related health issues), only male gender and willing to participate in the study and have no prior experience of yoga and meditation were included.

EXCLUSION

People with cut in fingers and absent fingers, undergoing any other wellness strategy and those who have smoked or taken alcohol or drugs on the day before the measurement were excluded.

5.3 INTEGRATED YOGA MODULE STUDY PROTOCOL

SUBJECTS

Pilot study on n=10, $\alpha = 0.05$, $\beta = 0.80$, $d = 0.34$, estimated sample size n=54. (G*Power 3.0.10).

Total of 152 volunteers attending one month of Yoga Instructor Course (YIC) were assessed before and after four weeks of their program. Participants from four different batches of the YIC (May-2014, n=43, June-2014, n=52, July-2014, n=38 and August-2014, n=19) at Swami Vivekananda Yoga Anusamdhana Samsthana (S-VYASA, Yoga University), Bangalore, Karnataka, India, were considered for the study.

INCLUSION CRITERIA

Healthy volunteers, age ranging from 18 to 60 years, both male and female, willing to participate in the study and having post hoc Integral Area value between -0.6 to +1 (range of normal health index in EPI system for the EU population) were included within the study.

EXCLUSION CRITERIA

Volunteers who had cut in fingers, absent fingers, having any health-related issues, substance abuse were excluded from the study.

5.4 ETHICAL CONSIDERATION

The protocol was approved by the Institutional Ethics Committee (Appendix-6). All the participants were informed about the study and the assessments before conducting the study and the signed informed consents were obtained from all the subjects. They were thus conversant with the aims and objectives of the study as well as the intervention modules and their confidentiality was maintained.

5.5 DESIGN

1. Normative study

It is a normative study following a survey design in which data collection was done only once from all participants.

2. Cyclic Meditation VS Supine Rest

This is two-group comparative design, in which all the subjects were randomised into two groups, CM and SR, using GraphPad software, an online program. EPI readings were carried out before and after 35 min of interventions, within 10 min for pre-assessment and 5 min for post-assessment.

3. Integrated Yoga Module

It is a **s**ingle arm prospective study, in which four experiments were carried out on four different YIC programs. All subjects were assessed before and after four weeks of their YIC course.

5.6 INTERVENTIONS

CYCLIC MEDITATION VS SUPINE REST

Self-management of excessive tension program includes theory lectures on the concept of stress and its management and followed by practical sessions of CM. Apart from this, all the subjects also attend Morning Prayer and evening devotional session (Bhajan) as a part of daily activity in the residential setup.

CYCLIC MEDITATION

The basis of this CM is stimulation followed by relaxation, which gives profound rest in periodic cycles. CM is a module in which asana is an inherent component. This module CM has been tested in earlier studies investigated various physiological, neurophysiological and psychophysiological variables in comparison to SR (yogic method of relaxation). Previous studies have used the CM practice that lasts for 22 min and 30 s (Subramanya & Telles, 2009b). Present study involves 35 min of CM practice, divided into eight steps.

Step-1: Opening prayer (1 min), the practice began with lead and follow of verse from a yoga text, the *Mandukya Upanishad* (Lokeswarananda, 2005). Step-2: Instant relaxation technique (1 min), it is done by isometric contraction of the muscles of the body and ends with SR. Step-3: Centering (4 min); coming to standing position namely, *Tadasana* with both feet planted firmly on the ground followed by *Brahmari* chanting. Step-4: Standing posture called *Ardhakatichakrasana* (6 min) from *Tadasana* bending toward the right (1 min and 30 s); a pause of 1 min and 30 s in *Tadasana*, then bending toward the left (1 min and 30 s); a pause of 1 min and 30 s in *Tadasana* again. Step-5: Quick relaxation technique (5 min), in the SR with guided instructions and ends with the chanting of AAA (*A-Kara*) with an open mouth. Step-6: Sitting postures, *Vajrasana*, *Shashankasana* and *Ushtrasana* (6 min), coming to *Vajrasana* (1 min), bending forward (*Shashankasana*, 1 min and 30 s, followed by *M-Kara* chanting) a pause of 1 min and 30 s in *Vajrasana*, bending backward (*Ushtrasana*, 1 min and 30 s, followed by *A-Kara* chanting); a pause of 1 min and 30 s. Step-7: Deep relaxation technique (10 min) slowly coming to the supine position for further relaxation of different parts of the body in a sequence as per instructions. Step-8: Closing prayer (2 min), the practice session is concluded with a prayer for the welfare of all.

SUPINE REST

The second group was given an equal duration of 35 min of SR in which subjects were lying down on a mat in the corpse posture (*Shavasana*). This is done with eyes closed, hands half feet away from the body, palms facing upward, legs apart at one and half feet distance and adopting a comfortable posture for 35 min.

INTEGRATED YOGA MODULE

Integrated Yoga Module for four weeks comprises of Kriyas (cleansing techniques), Asanas (Physical postures), Pranayama (Breathing practices), Dhyana (meditation), Bhajan (devotional songs), Krida Yoga (Yoga games), spiritual discourses and lectures on yoga and philosophy. The program starts daily at 4.30 am till 10.00 pm and the diet is vegetarian (yogic food).

5.7 ASSESSMENT TOOL

The EPI Camera Pro and compact instrument made by Kirlionics Technologies International, Saint-Petersburg, Russia were used for assessment.

Figure16: EPI/GDV-COMPACT

Figure17: EPI/GDV-PRO

ELECTRO PHOTONIC IMAGING PARAMETERS

Assessment through EPI is carried out in two ways: (a) With filter (known as physiological level of evaluation) and, (b) without filter (known as psychophysiological level of evaluation) (Korotkov et al., 2012). Filter is a specially designed thin plastic film. During the measurement process, a filter is placed between the fingertip and the dielectric glass plate which helps to eliminate sweat effects due to sympathetic responses and provides information which is of physiological only (Korotkov et al., 2012). Comparison of these images acquired in two different ways forms a parameter called activation coefficient. This parameter has proved very stable and accurate with EPI/GDV studies in the last 15 years (Korotkov et al., 2012). Activation Coefficient (AC) is an absolute magnitude of differences of coefficients of diagrams created using EPI-images captured with and without filter taking corresponding dispersions (Korotkov, 2002b), which is a quantitative assessment of stress level in a person, based on evaluation of autonomic balance (Korotkov, 2002a). This AC (EU population based) is scaled from 0 to 10 where 0–2 is a value for calm and relaxed people. However, this range 0–2 may be due to two possible conditions: either the person is in very deep meditation or chronic depression. Values 2–4 are indicative of normal state; 4–6 is seen in an excited state, hence is indicative of more stressful conditions; 6–8 represents higher levels of stress; and finally, 8–10 is a condition of high level of stress (Korotkov et al., 2012). Further, the experimental data correlating the findings of EPI measures with heart rate variability (HRV) (Cioca, Giacomoni, & Rein, 2004), systolic and diastolic pressures (Aleksandrova et al., 2011), and the stress level (Korotkov, 2011a) suggest that EPI measures activity of autonomic responses.

Two more important component of Electro photonic imaging that are driven using various mathematical algorithm in EPI system are Integral Area and Integral Entropy. Integral Area (IA) is a measure of general health index of the person being investigated (Korotkov, 2002b). The normal range for IA (EU population based) is (−0.6 to + 1), corresponds to a good health state. The second constituent Integral Entropy (IE) is a measure of chaos/disorder in the energy pattern of human energy systems (Kostyuk et al., 2011). Entropy in the EPI system ranges (1 to 2) is considered normal as per the European norms.

5.8 DATA TAKING PROCEDURE

To obtain reliable and reproducible data, we followed an established guideline (Alexandrova et al., 2002). It is recommended to collect data after 3 hours of food intake and after 5 hours of any prescribed medications. No other diagnostic procedure was to be held at the same time. They were assessed before and after the respective interventions, and the EPI readings were taken by the same expert, at the same place. There were identical conditions of psychological and physical comfort for all Subjects in a quiet and calm environment. Calibration of EPI device was performed routinely as per the guidelines. Subjects were instructed about finger placement on the glass at 45° angles with a gentle but firm touch. They were asked to remove all metallic ornaments that they do not wear for the entire 24 hours a day. Further, a few more things were followed for acquiring consistent readings: (1) The subjects stand on an electrically isolated surface while making a measurement; (2) the measurements were taken first with the filter, then without filter; (3) an alcoholic solution was used to clean the glass plate after every subject; and (4) a distance of three feet was maintained between EPI and a dedicated laptop computer while collecting data (Yakovleva & Korotkov, 2015b).

(The next chapter deals with data collection, extraction and analysis)

CHAPTER – 6.0

DATA EXTRACTION AND ANALYSIS

CHAPTER	CONTENT	PAGE NO.
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6.0 DATA EXTRACTION AND ANALYSIS

6.1 DATA COLLECTION

All data were collected using GDV instrument attached with computer system for its operation through installed GDV software. Demographic data and consent forms were obtained using written forms.

6.2 DATA EXTRACTION

The Diagram Software Program of EPI technique was used to extract the raw data into Excel sheet. This diagram program provides all parameters which were taken into consideration for analysis, namely Activation Coefficient, Integral Area and Integral Entropy.

6.3 DATA ANALYSIS

Data analysis was carried out using "R statistical package" for data analysis (R Development Core team, 2014).

NORMATIVE STUDY

First of all, analysis was performed for all subjects taken together and further, separate analyses were carried out for males and females, age groups 18 to 40 and 41 to 60 years, and also on the basis of diet pattern. As each of the variables was not found to be normally distributed, for each of the EPI parameters, 25^{th} and 75^{th} percentiles were taken keeping a sample size (healthy population) of n=880, and further 25^{th} and 75^{th} percentiles were bootstrapped keeping sampling, k=1,000, and corresponding bootstrapped 95% confidence intervals were also calculated (Peng, 2008). Z score with cut off value of 1.96 Z score for two tailed condition was considered for differentiating the observed norms for the Indian population from the established norms for the European population.

CYCLIC MEDITATION VS SUPINE REST

To compare the baseline demographic details, the independent samples *t*-test was performed for continuous variables. Both groups showed similarities in most of the demographic details except age and diastolic blood pressure as presented in Table 12. Further, within group analyses were carried out using paired sample *t*-tests and between group analyses using independent sample *t*-tests, correcting for any possible mismatch at baseline by considering pre- and post-differences.

INTEGRATED YOGA MODULE

Paired sample t-test was used for evaluating pre post readings and independent sample t-test for cross sectional comparisons between male and female subgroups.

(In the next chapter we present the results of all three projects)

CHAPTER – 7.0

RESULTS

CHAPTER	CONTENT	PAGE NO.
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7.0 RESULTS

7.1 NORMATIVE DATA

Out of 1297 screened volunteers, only 880 healthy subjects were considered for analysis who were eligible as per the inclusion and exclusion criteria. Out of 880 subjects, there were 584 males and 296 females. Table 4 presents the characteristics for all subjects.

Table-4: Baseline characteristics of subjects

Variables		**Mean±SD (n)** **(n) %**
Age Range		33.55±10.92 years (880) 18 – 60 years
Height		165.41±15.11 cm (758)
Weight		64.78±12.61 Kg (758)
Body Mass Index		23.85±4.60 Kg/m^2 (758)
Gender:	Male	(584) 66%
	Female	(296) 34%
Marital status:	Married	(458) 52%
	Unmarried	(371) 42%
	Not reported	(51) 6%
Education:	<College level	(175) 20%
	Graduation level	(394) 45%
	>Graduation	(241) 27%
	Not reported	(70) 8%

Table 5: EPI norms extracted from EPI Diagram software program (Healthy n=880)

Mode of measurement	Variables	25^{th}, 75^{th} Percentile (n=880)	Bootstrap 25^{th} Percentile (95% CI) (k=1000)	25^{th} percentile Z-score	Bootstrap 75^{th} Percentile (95% CI) (k=1000)	75^{th} percentile Z-score	European Range	Indian norms
	AC	2.27, 3.41	2.27 (2.20, 2.29)	-0.57	3.41 (3.28, 3.56)	0.42	2, 4	2, 3.5
With filter	IAL	0.28, 0.50	0.28 (0.26, 0.29)	-2.29	0.50 (0.47, 0.51)	-2.10	-0.6, +1	0.2, 0.6
	IAR	0.29, 0.51	0.29 (0.27, 0.30)	-2.28	0.51 (0.48, 0.51)	-2.09	-0.6, +1	0.2, 0.6
	IEL	1.83, 2.04	1.83 (1.80, 1.84)	-0.95	2.04 (2.03, 2.06)	-0.77	1, 2	1.7, 2.1
	IER	1.82, 2.05	1.82 (1.80, 1.83)	-0.96	2.05 (2.03, 2,06)	-0.76	1, 2	1.7, 2.1
Without filter	IAL	-0.10, 0.21	-0.10 (-0.15, -0.08)	-2.62	0.21 (0.18, 0.22)	-2.35	-0.6, +1	-0.3, +0.4
	IAR	-0.07, 0.21	-0.07 (-0.10, -0.06)	-2.60	0.21 (0.18, 0.22)	-2.35	-0.6, +1	-0.3, +0.4
	IEL	1.76, 2.00	1.76 (1.73, 1.77)	-1.01	2.00, (1.98, 2.00)	-0.80	1, 2	1.6, 2.1
	IER	1.79, 2.02	1.79 (1.76, 1.80)	-0.98	2.02 (2.00, 2.02)	-0.78	1, 2	1.6, 2.1

Abbreviations: AC-Activation Coefficient, IAL-Integral Area Left side, IAR-Integral Area Right side, IEL-Integral Entropy Left side and IER-Integral Entropy Right side.

RESULTS FROM TABLE - 5

Activation Coefficient

The range of values for normal healthy people in Indian population is 2.27 to 3.41. The European range is 2 to 4. The 25th percentile is (-0.57 SD) away from the mean and the 75th percentile is (+0.42 SD) away from the mean. As they are less than 1.96 Z score (cutoff Z values for two tailed condition), we conclude that the obtained *range in the Indian population is not different from the European values of AC.*

Parameters from with-filter readings

Integral Area Left side (IAL) and Right side (IAR)

The observed IAL with filter values for a healthy Indian population range from 0.28 to 0.50 and IAR with filter values from 0.29 to 0.51, whereas these values for European population are -0.6 to +1 for both IAL and IAR. The observed 25th percentile for IAL is (-2.29 SD) away from the mean and the 75th percentile is (-2.10 SD) away from the mean, whereas 25th percentile for IAR is (-2.28 SD) and 75th percentile is (-2.09 SD) away from the mean. In both IAL and IAR these values are more than 1.96 Z score, therefore *the obtained values of these parameters for Indians are different from European population.*

Integral Entropy Left side (IEL) and Right side (IER)

The observed 25th and 75th percentile for IEL with filter readings for Indian population range from 1.83 to 2.04, and for IER the range is from 1.82 to 2.05. In the European population the range is 1 to 2. The 25th percentile value for IEL is (-0.95 SD) and the 75th percentile is (-0.77 SD). The 25th percentile value for IER is (-0.96 SD) and 75th percentile

(-0.76 SD). In both cases, they are less than 1.96 Z score, therefore we consider that *they are not different from European values.*

Parameters from without-filter readings

Integral Area Left and Right sides

For IAL, the observed 25th percentile and 75th percentile values are -0.10, 0.21 and for IAR these are -0.07, 0.21 in Indian population, whereas for both IAL and IAR these values for EU population are -0.6 to +1. The 25th percentile value for IA left is (-2.62 SD), and the 75th percentile is (-2.35 SD). For IA right, the 25th percentile value is (-2.60 SD) and the 75th percentile is (-2.35 SD). Both are larger than 1.96 Z score, therefore *the Indian norms are considered different from European values.*

Integral Entropy Left and Right sides: For IEL the observed 25th percentile and 75th percentile values are 1.76 to 2.00 and for IER these are 1.79 to 2.02 in Indian population, whereas for European population these are 1 to 2. The 25th percentile value for IE left is (-1.01 SD), and the 75th percentile is (-0.80 SD). For IE right, the 25th percentile value is (-0.98 SD) and the 75th percentile is (-0.78 SD). Both are less than 1.96 Z score, therefore they can be *considered not different from European values.*

Table 6: EPI norms extracted from the EPI Diagram software program (Male n=584)

Mode of measurement	Variables	25th, 75th Percentile (n=584)	Bootstrap 25th Percentile (95% CI) (k=1000)	25th percentile Z-score	Bootstrap 75th Percentile (95% CI) (k=1000)	75th percentile Z-score	European Range
	AC	2.28, 3.36	2.28 (2.21, 2.32)	-0.55	3.36 (3.22, 3.57)	0.41	2, 4
With filter	IAL	0.32, 0.52	0.32 (0.30, 0.33)	-2.30	0.52 (0.51, 0.53)	-2.12	-0.6, +1
	IAR	0.33, 0.53	0.33 (0.30, 0.34)	-2.29	0.53 (0.51, 0.54)	-2.11	-0.6, +1
	IEL	1.83, 2.04	1.83 (1.80, 1.85)	-0.95	2.04 (2.00, 2.05)	-0.76	1, 2
	IER	1.83, 2.06	1.83 (1.80, 1.85)	-0.95	2.06 (2.03, 2,06)	-0.75	1, 2
Without filter	IAL	-0.05, 0.24	-0.05 (-0.09, -0.01)	-2.63	0.24 (0.21, 0.25)	-2.37	-0.6, +1
	IAR	-0.02, 0.23	-0.02 (-0.07, -0.01)	-2.60	0.23 (0.21, 0.24)	-2.38	-0.6, +1
	IEL	1.74, 2.00	1.74 (1.71, 1.76)	-1.03	2.00, (1.97, 2.02)	-0.80	1, 2
	IER	1.78, 2.02	1.78 (1.74, 1.79)	-1.00	2.02 (2.00, 2.02)	-0.78	1, 2

Abbreviations: AC-Activation Coefficient, IAL-Integral Area Left side, IAR-Integral Area Right side, IEL-Integral Entropy Left side and IER-Integral Entropy Right side.

Table 7: EPI norms extracted from the EPI Diagram software program (Female n=296)

Mode of measurement	Variables	25^{th}, 75^{th} Percentile (n=296)	Bootstrap 25^{th} Percentile (95% CI) (k=1000)	25^{th} percentile Z-score	Bootstrap 75^{th} Percentile (95% CI) (k=1000)	75^{th} percentile Z-score	European Range
	AC	2.27, 3.44	2.27 (2.15, 2.33)	-0.58	3.44 (3.23, 3.69)	0.31	2, 4
With filter	IAL	0.22, 0.42	0.22 (0.19, 0.23)	-2.19	0.42 (0.38, 0.43)	-2.02	-0.6, +1
	IAR	0.22, 0.43	0.22 (0.20, 0.24)	-2.18	0.43 (0.39, 0.45)	-2.02	-0.6, +1
	IEL	1.83, 2.03	1.83 (1.79, 1.84)	-0.95	2.03 (2.01, 2.05)	-0.77	1, 2
	IER	1.81, 2.05	1.81 (1.77, 1.82)	-0.95	2.05 (2.02, 2,06)	-0.76	1, 2
Without filter	IAL	-0.18, 0.12	-0.18 (-0.22, -0.13)	-2.49	0.12 (0.09, 0.16)	-2.25	-0.6, +1
	IAR	-0.15, 0.14	-0.15 (-0.20, -0.11)	-2.47	0.14 (0.10, 0.15)	-2.26	-0.6, +1
	IEL	1.81, 2.01	1.81 (1.78, 1.83)	-1.02	2.01, (1.99, 2.03)	-0.81	1, 2
	IER	1.79, 2.03	1.79 (1.73, 1.80)	-0.99	2.03 (2.00, 2.05)	-0.79	1, 2

Abbreviations: AC-Activation Coefficient, IAL-Integral Area Left side, IAR-Integral Area Right side, IEL-Integral Entropy Left side and IER-Integral Entropy Right side.

Table 8: EPI norms extracted from the EPI Diagram software program (Age 18-40 years, n=651)

Mode of measurement	Variables	25^{th}, 75^{th} Percentile (n=651)	Bootstrap 25^{th} Percentile (95% CI) (k=1000)	25^{th} percentile Z-score	Bootstrap 75^{th} Percentile (95% CI) (k=1000)	75^{th} percentile Z-score	European Range
	AC	2.30, 3.55	2.30 (2.25, 2.36)	-0.62	3.55 (3.35, 3.65)	0.42	2, 4
With filter	IAL	0.28, 0.49	0.28 (0.26, 0.29)	-2.31	0.49 (0.47, 0.50)	-2.14	-0.6, +1
	IAR	0.29, 0.50	0.29 (0.27, 0.30)	-2.31	0.50 (0.48, 0.51)	-2.13	-0.6, +1
	IEL	1.83, 2.04	1.83 (1.80, 1.84)	-1.02	2.04 (2.02, 2.05)	-0.84	1, 2
	IER	1.82, 2.05	1.82 (1.79, 1.83)	-1.02	2.05 (2.02, 2,06)	-0.83	1, 2
Without filter	IAL	-0.14, 0.18	-0.14 (-0.17, -0.10)	-2.67	0.18 (0.15, 0.19)	-2.40	-0.6, +1
	IAR	-0.10, 0.19	-0.10 (-0.15, -0.08)	-2.63	0.19 (0.16, 0.21)	-2.39	-0.6, +1
	IEL	1.76, 2.01	1.76 (1.72, 1.77)	-1.10	2.01, (1.99, 2.02)	-0.87	1, 2
	IER	1.78, 2.02	1.78 (1.75, 1.78)	-1.06	2.02 (2.00, 2.02)	-0.83	1, 2

Abbreviations: AC-Activation Coefficient, IAL-Integral Area Left, IAR-Integral Area Right, IEL-Integral Entropy Left and IER-Integral Entropy Right.

Table 9: EPI norms extracted from the EPI Diagram software program (Age 41-60 years, n=252)

Mode of measurement	Variables	25th, 75th Percentile (n=252)	Bootstrap 25th Percentile (95% CI) (k=1000)	25th percentile Z-score	Bootstrap 75th Percentile (95% CI) (k=1000)	75th percentile Z-score	European Range
	AC	2.10, 3.00	2.10 (1.93, 2.23)	-0.51	3.00 (2.83, 3.15)	0.42	2, 4
With filter	IAL	0.30, 0.52	0.30 (0.24, 0.31)	-2.38	0.52 (0.49, 0.53)	-2.15	-0.6, +1
	IAR	0.30, 0.52	0.30 (0.26, 0.32)	-2.38	0.52 (0.48, 0.53)	-2.15	-0.6, +1
	IEL	1.82, 2.04	1.82 (1.77, 1.85)	-0.80	2.04 (2.00, 2.06)	-0.58	1, 2
	IER	1.84, 2.06	1.84 (1.79, 1.85)	-0.78	2.06 (2.02, 2,07)	-0.83	1, 2
Without filter	IAL	0.01, 0.25	0.01 (-0.08, 0.03)	-2.84	0.25 (0.20, 0.26)	-2.51	-0.6, +1
	IAR	0.01, 0.22	0.01 (-0.04, 0.01)	-2.80	0.22 (0.19, 0.22)	-2.50	-0.6, +1
	IEL	1.77, 2.00	1.77 (1.73, 1.81)	-0.89	2.00, (1.96, 2.01)	-0.61	1, 2
	IER	1.80, 2.04	1.80 (1.75, 1.83)	-0.85	2.04 (2.01, 2.06)	-0.60	1, 2

Abbreviations: AC-Activation Coefficient, IAL-Integral Area Left, IAR-Integral Area Right, IEL-Integral Entropy Left and IER-Integral Entropy Right.

Table 10: GDV norms extracted from the EPI Diagram software program (Veg, n=443)

Mode of measurement	Variables	25^{th}, 75^{th} Percentile (n=443)	Bootstrap 25^{th} Percentile (95% CI) (k=1000)	25^{th} percentile Z-score	Bootstrap 75^{th} Percentile (95% CI) (k=1000)	75^{th} percentile Z-score	European Range
	AC	2.27, 3.28	2.27 (2.19, 2.29)	-0.55	3.28 (3.12, 3.42)	0.36	2, 4
With filter	IAL	0.29, 0.51	0.29 (0.26, 0.30)	-2.34	0.51 (0.48, 0.52)	-2.14	-0.6, +1
	IAR	0.29, 0.51	0.29 (0.25, 0.30)	-2.34	0.51 (0.48, 0.51)	-2.14	-0.6, +1
	IEL	1.81, 2.03	1.81 (1.78, 1.83)	-0.97	2.03 (2.00, 2.04)	-0.77	1, 2
	IER	1.82, 2.05	1.82 (1.80, 1.84)	-0.97	2.05 (2.02, 2,07)	-0.75	1, 2
Without filter	IAL	-0.09, 0.21	-0.09 (-0.14, -0.07)	-2.68	0.21 (0.17, 0.23)	-2.41	-0.6, +1
	IAR	-0.06, 0.22	-0.06 (-0.11, -0.04)	-2.65	0.22 (0.19, 0.23)	-2.40	-0.6, +1
	IEL	1.75, 2.01	1.75 (1.70, 1.77)	-1.02	2.01, (1.98, 2.02)	-0.78	1, 2
	IER	1.79, 2.02	1.79 (1.75, 1.81)	-0.98	2.02 (2.00, 2.02)	-0.78	1, 2

Abbreviations: AC-Activation Coefficient, IAL-Integral Area Left side, IAR-Integral Area Right side, IEL-Integral Entropy Left side and IER-Integral Entropy Right side, Veg - vegetarians.

Table 11: EPI norms extracted from the EPI Diagram software program (Non-veg, n=424)

Mode of measurement	Variables	25th, 75th Percentile (n=424)	Bootstrap 25th Percentile (95% CI) (k=1000)	25th percentile Z-score	Bootstrap 75th Percentile (95% CI) (k=1000)	75th percentile Z-score	European Range
	AC	2.30, 3.51	2.30 (2.22, 2.36)	-0.55	3.51 (3.32, 3.66)	0.46	2, 4
With filter	IAL	0.28, 0.49	0.28 (0.26, 0.31)	-2.25	0.49 (0.47, 0.51)	-2.07	-0.6, +1
	IAR	0.28, 0.50	0.28 (0.24, 0.28)	-2.45	0.50 (0.47, 0.51)	-2.06	-0.6, +1
	IEL	1.83, 2.05	1.83 (1.78, 1.83)	-0.95	2.05 (2.03, 2.06)	-0.76	1, 2
	IER	1.83, 2.06	1.83 (1.79, 1.84)	-0.95	2.06 (2.03, 2,06)	-0.76	1, 2
Without filter	IAL	-0.13, 0.20	-0.13 (-0.18, -0.08)	-2.59	0.20 (0.17, 0.22)	-2.31	-0.6, +1
	IAR	-0.09, 0.20	-0.09 (-0.15, -0.07)	-2.49	0.20 (0.17, 0.22)	-2.31	-0.6, +1
	IEL	1.77, 2.00	1.77 (1.73, 1.79)	-1.00	2.00, (1.97, 2.00)	-0.80	1, 2
	IER	1.78, 2.02	1.78 (1.74, 1.79)	-0.99	2.02 (2.00, 2.04)	-0.79	1, 2

Abbreviations: AC-Activation Coefficient, IAL-Integral Area Left side, IAR-Integral Area Right side, IEL-Integral Entropy Left side and IER-Integral Entropy Right side, Non-veg -non-vegetarians.

Table, 6 and 7. The analysis to check gender differences demonstrated a similar trend as per the norms for healthy Indian population in comparison to the European population.

Table, 8 and 9. The subgroup analysis to check whether EPI norms are different in two sets of age groups 18-40 and 41-60 years showed a similar trend as per the norms for healthy Indian population in comparison to the EU population.

Table 10 and 11. The subgroup analysis of vegetarian and non-vegetarian subjects also showed the same trend as the results of overall healthy Indian norms against European norms.

Graphical presentation of data distribution for all variables

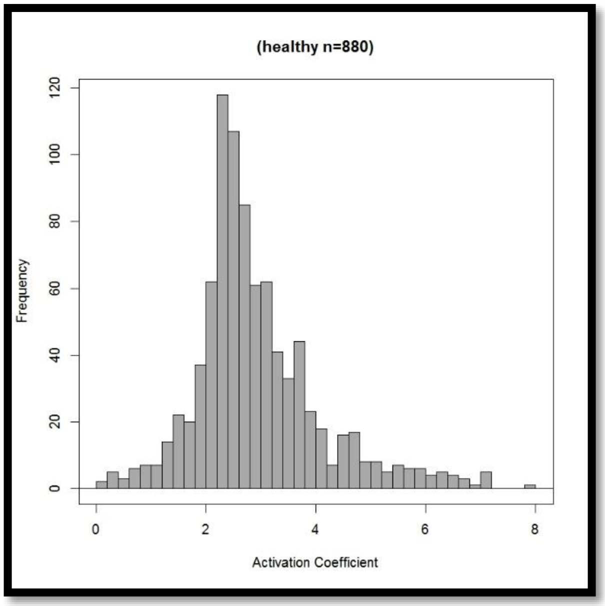


Figure-18 Activation Coefficient

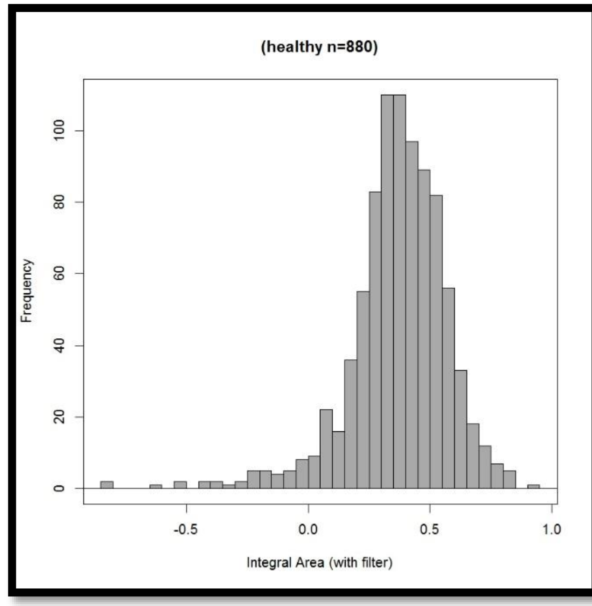


Figure-19 Integral Area (With filter)

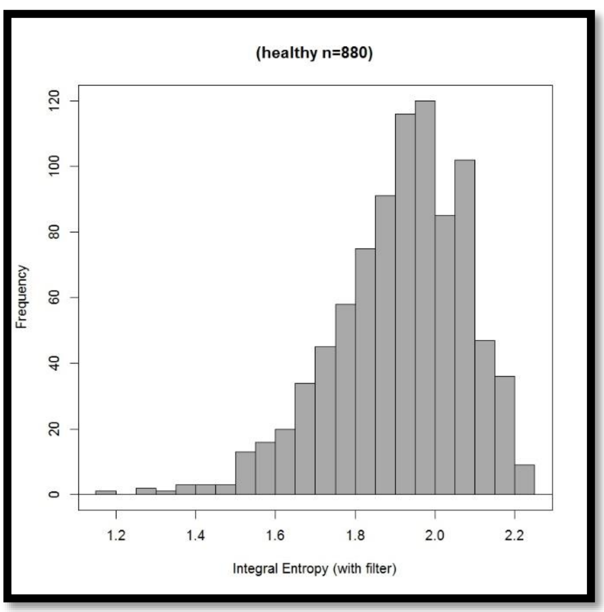


Figure-20 Integral Entropy (With filter)

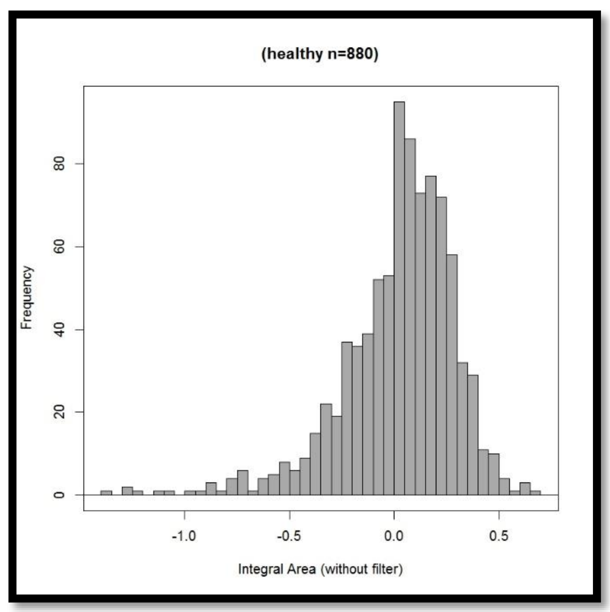


Figure-21 Integral Area (Without filter)

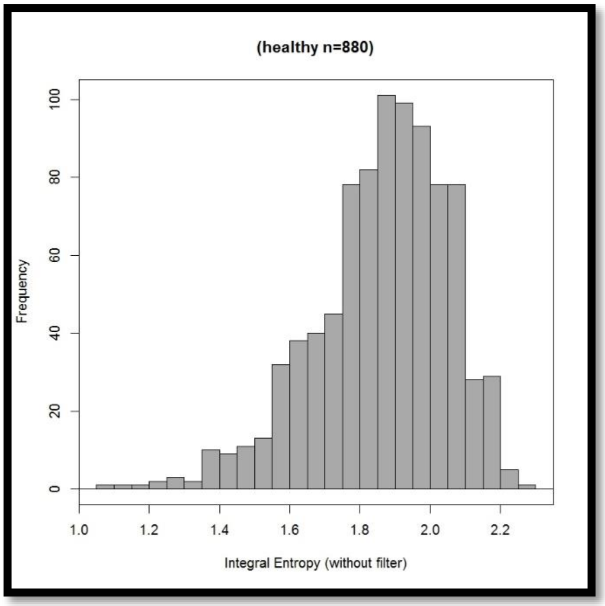


Figure -22 Integral Entropy (Without filter)

In the European norms, the condition of two standard deviation from the mean value was taken for the norms as the data were normally distributed (Bundzen & Korotkov, 2002). However, in the present study, all variables were not normally distributed (Figures 18-22), therefore the 25th and 75th percentile values were considered for the normal range, as these values are quartile based and not affected by skewness. However, we used 1.96 as cut off Z score assuming a normal sampling distribution for these variables. These percentile values were further estimated for interval estimates using a bootstrap procedure and a very narrow bootstrapped 95% confidence intervals were obtained. In the Figures 18, 19, 20, 21 and 22 most of the data spread is closer to the observed percentile range. From these results of existing data, and from our practical observation in Indian population, we propose the following ranges for the EPI parameters of the EPI Diagram program:

a) Activation coefficient: 2.0 to 3.5; [European Norm: 2.0 to 4.0]

b) Integral area with filter: 0.2 to 0.6; [European Norm: -0.6 to +1]

c) Integral entropy with filter: 1.7 to 2.1; [European Norm: +1 to +2]

d) Integral area without filter: -0.3 to +0.4; [European Norm: [-0.6 to +1]

e) Integral entropy without filter: 1.6 to 2.1; [European Norm: +1 to +2]

7.2 CYCLIC MEDITATION VS SUPINE REST

Of 114 managers, a total of 66 male managers (CM - 33, and SR - 33), age range from 35 to 60 years (mean ± standard deviation 53.97 ± 5.96 years) who were eligible as per the inclusion and exclusion criteria were only selected for the analysis.

Table 12: Demographic details of participants by groups

Variables	Mean±SD		*p*-value
	CM (*n*=33)	SR (*n*=33)	
Age range, years	52.48±6.59 (38–59)	55.45±4.91 (35–60)	0.04
PR (BPM)	76.42±8.89	78.21±12.28	0.50
SBP (mm Hg)	123.45±12.00	128.12±12.61	0.13
DBP (mm Hg)	80.90±5.25	84.06±6.60	0.04
BMI(kg/m^2)	26.05±3.43	26.66±4.45	0.81

CM: Cyclic meditation, SR: Supine rest, PR (BPM): Pulse rate (beats per minute), SBP: Systolic blood pressure, DBP: Diastolic blood pressure, BMI: Body mass index, SD: Standard deviation

Table 12 presents demographic details of both the groups, along with independent sample t test p values. The groups were different only in age and diastolic blood pressure measurements, whereas all other variables, namely, pulse rate, systolic blood pressure, and body mass index were not different in both the groups.

Temperature and humidity aspects during the study

Environment variables such as humidity and temperature might influence EP emission pattern especially if this variation is more than ±2.5% (Korotkov, 2011b). Thus, we measured these atmospheric variables and found both were almost similar during pre and post measurements in both the groups. The average temperatures during all the four CM experiments was pre 28.28 ± 0.64 and post 27.86 ± 0.89, and average humidity were pre 58% and post 58%. The average temperature across all the four SR experiments were pre 26.58 ± 0.30 and post 26.18 ± 1.14, and average humidity: Pre 53% and post 54% (measured using thermo/Hygrometer-Equinox, EQ 310 CTH).

Table 13: Within group and between groups results for AC, IA and IE values															
Variables	**CM**							**SR**							**Between groups**	
	Mean±SD		***t*-value**	**Percentage change %**	***d***	***p*-value**	**Mean±SD**		***t*-value**	**Percentage change %**	***d***	***p*-value**	***t*-value**	***p*-value**
AC	Pre	2.85±0.82	3.05	14.51	0.53	0.005**	Pre	2.63±0.71	1.45	7.21	0.26	0.15	1.13	0.26
	Post	2.44±0.83					Post	2.44±0.74						
IER	Pre	1.97±0.14	2.1	3.76	0.36	0.04*	Pre	1.84±0.18	−0.48	−1.11	0.09	0.64	1.30	0.20
	Post	1.90±0.17					Post	1.86±0.18						
IEL	Pre	1.85±0.21	−0.35	−0.92	0.06	0.73	Pre	1.79±0.25	−3.21	-8.36	0.55	0.003**	2.02	0.05*
	Post	1.86±0.20					Post	1.94±0.16						
IAR	Pre	0.21±0.17	−2.06	18.48	0.36	0.05*	Pre	0.21±0.19	−2.37	23.29	0.41	0.02*	0.44	0.66
	Post	0.25±0.15					Post	0.26±0.18						
IAL	Pre	0.19±0.20	−2.31	30.56	0.40	0.03*	Pre	0.23±0.20	−0.29	3.03	0.05	0.78	−1.34	0.18
	Post	0.24±0.11					Post	0.24±0.20						

Effect size is Cohen's d. Significant level, *P<0.05 and **P<0.01. AC: Activation coefficient, IEL: Integral entropy left, IER: Integral entropy right, IAL: Integral area left, IAR: Integral area right, SD: Standard deviation, CM: Cyclic meditation, SR: Supine rest, IA: Integral area, IE: Integral entropy

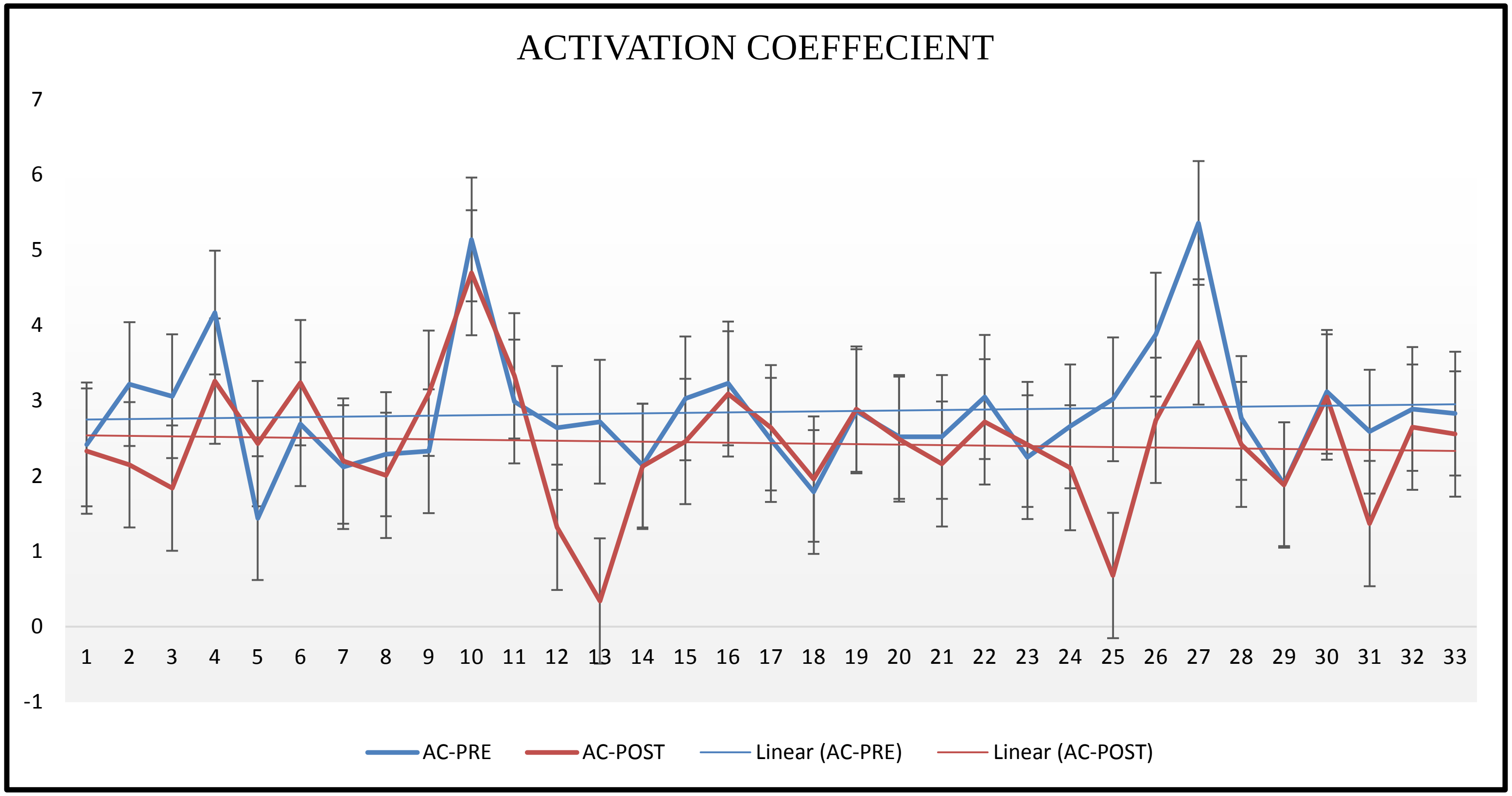
The results in Table 13 show that AC reduced highly significantly with 14.51% within the CM group while this reduction was not significant within SR group with 7.21% showing that CM is better than SR in decreasing stress. Entropy on the right side improved significantly by 3.76% within the CM group while deteriorated within the SR group by 1.11%. On the left side, entropy had no significant change, 0.92% within the CM group while it significantly deteriorated by 8.36% in the SR group leading to a significant change between groups. This shows that CM is better than SR in terms of changes in entropy. Both IA right and left showed a significant increase (IAR 18.48% and IAL 30.56%) within the CM group, whereas only IA right showed a significant increase and no significant change of IA left (IAR 23.59% and IAL 3.03%) within the SR group.

Figures

The Figures from 23 to 27 show almost uniform variations in measured parameters across the subjects.

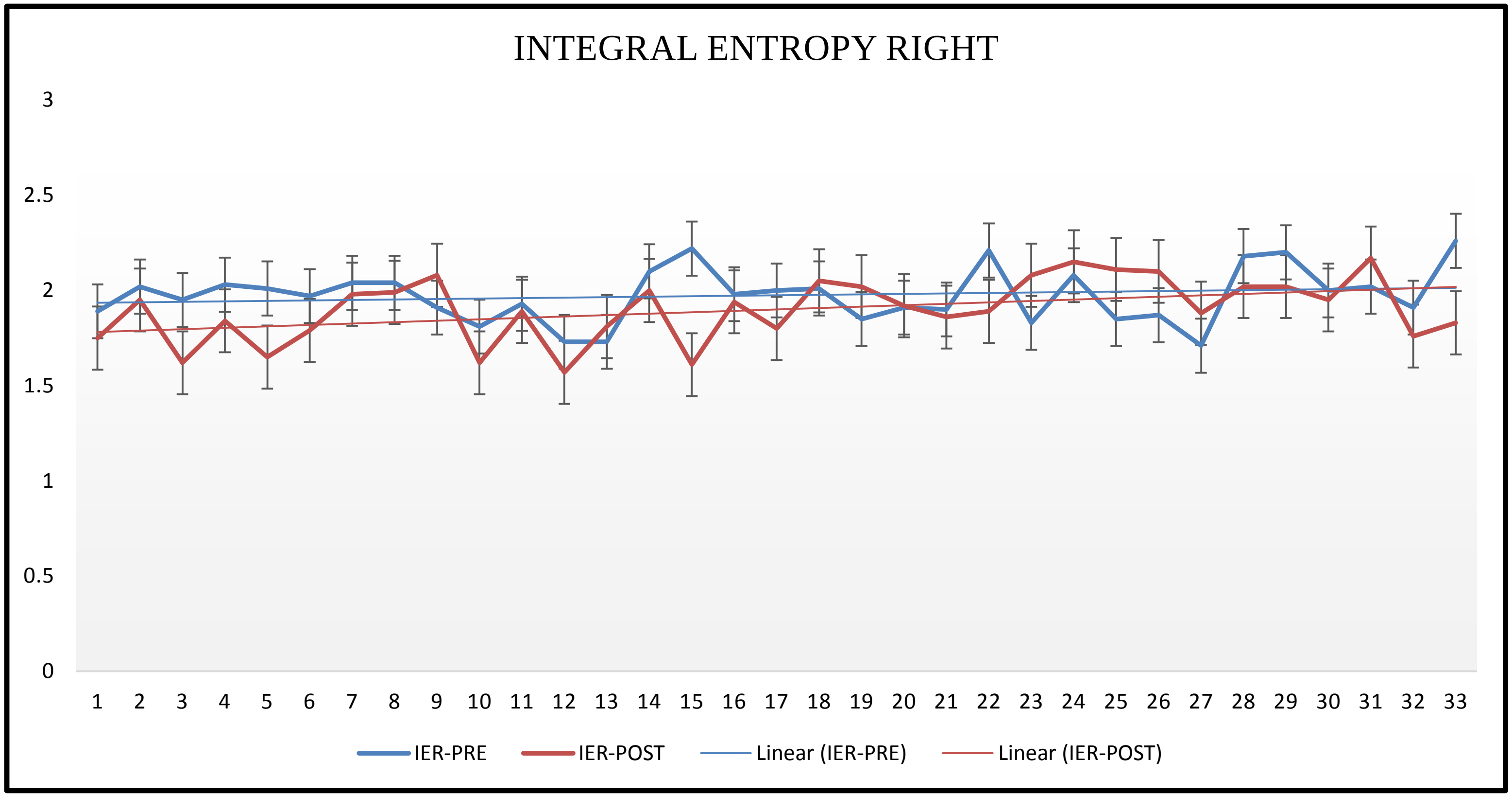
Figure Legends – subjects-wise variability in scores before and after the intervention

Figure 23: Activation coefficient values before and after cyclic meditation



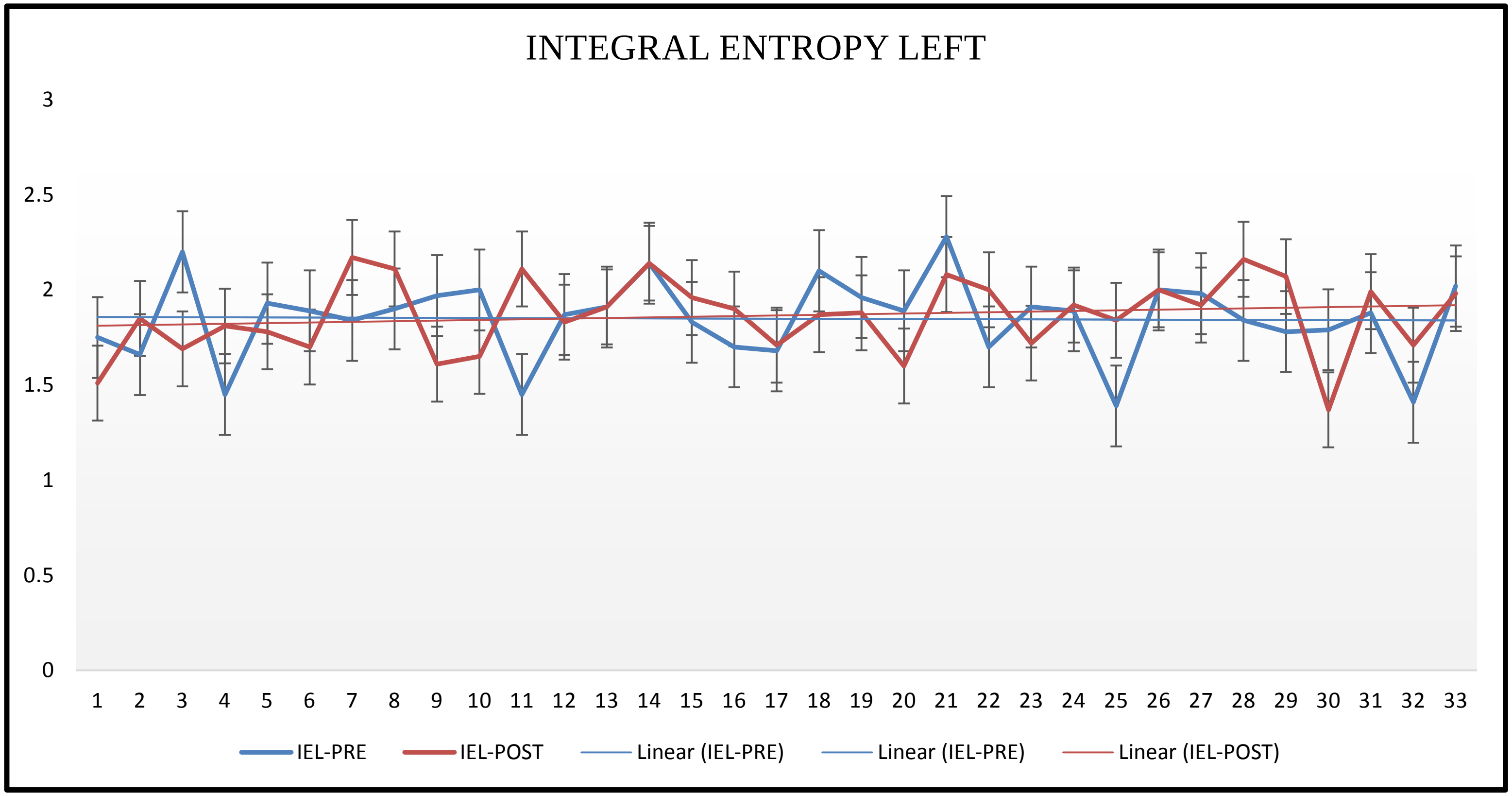
Individual distribution of activation coefficient parameter showing subjects-wise variability before and after the Cyclic Meditation

Figure 24: Integral entropy right side before and after cyclic meditation



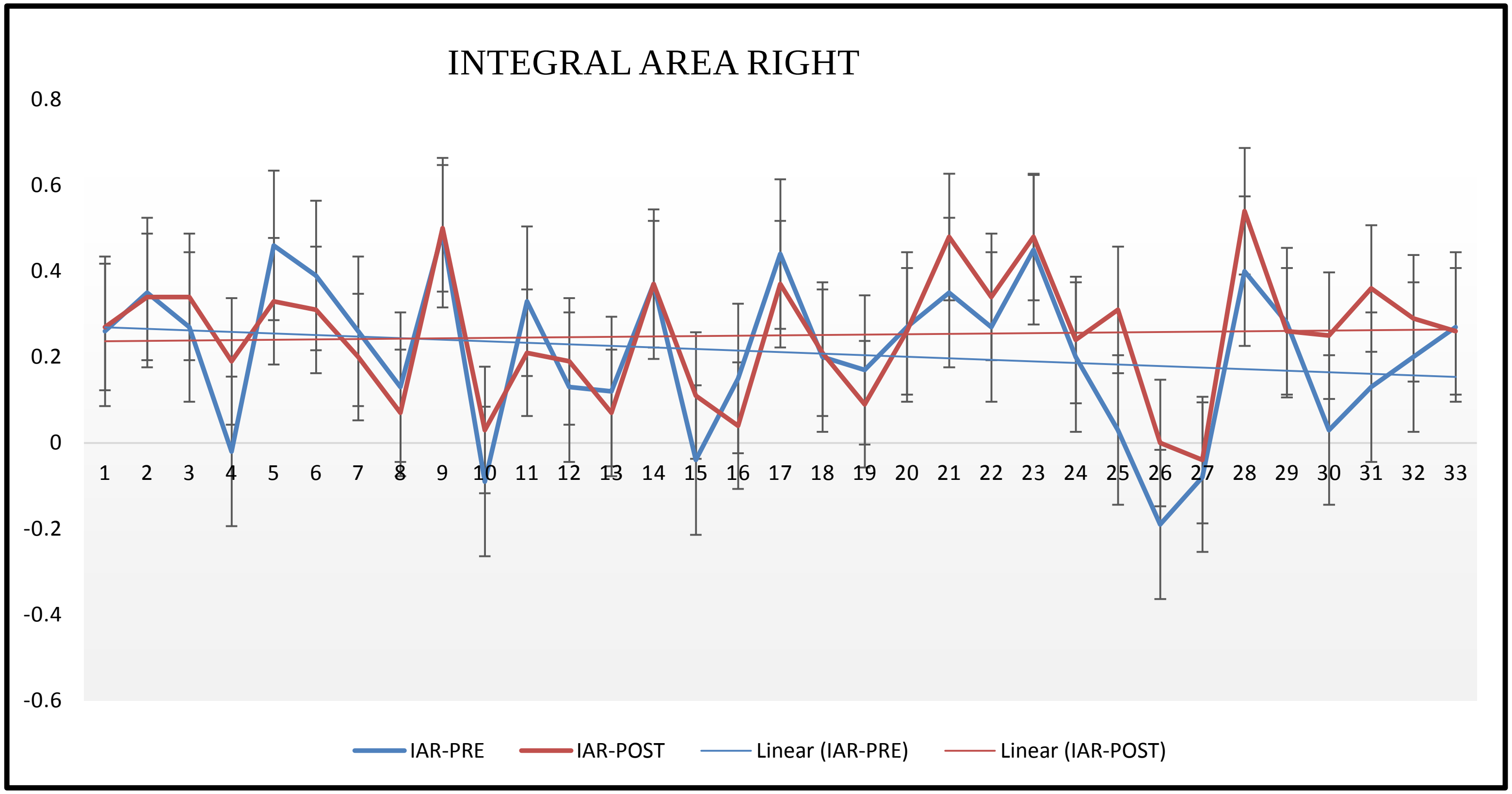
Individual distribution of integral entropy right parameter showing subject wise variability before and after the Cyclic Meditation

Figure 25: Integral entropy left side before and after cyclic meditation



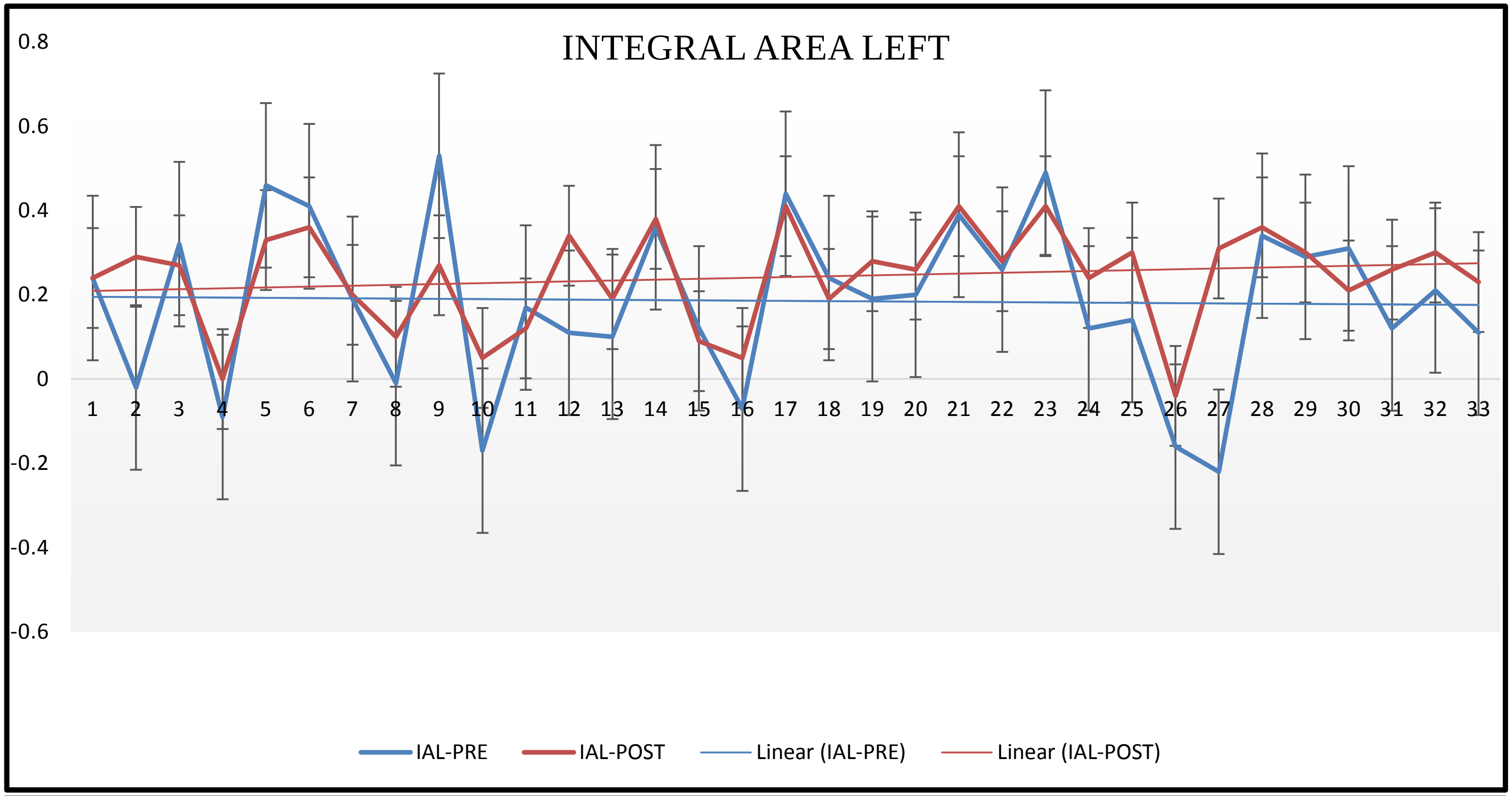
Individual distribution of integral entropy left parameter showing subject wise variability before and after the Cyclic Meditation

Figure 26: Integral area right side before and after cyclic meditation



Individual distribution of integral area right parameter showing subject wise variability before and after the Cyclic Meditation

Figure 27: Integral area left side before and after cyclic meditation



Individual distribution of integral area left parameter showing subject wise variability before and after the Cyclic Meditation

7.3 INTEGRATED YOGA MODULE

Table-14 participants' characteristics

Variables	**Male (*n*=55)**	**Female (*n*=39)**	**Total (*n*=94)**
Age (year)	26.93±9.12	26.36±7.87	26.70±8.58
Height (cm)	169.16±9.96	159.31±6.08	165.07±8.19
Weight (kg)	65.05±12.99	57.79±10.12	62.04±12.36
BMI (kg/m^2)	22.70±3.92	22.78±3.82	22.73±3.86

Out of 152 volunteers, a total of 94 healthy subjects (male 55 and female 39, age, mean±sd 26.70±8.58) who were eligible as per the inclusion and exclusion criteria were only considered in the analysis. **Table-14** presents the participants' characteristics of subgroups as males and females and as a whole. There is no difference between age and BMI of both the genders.

Humidity and Temperature measurements

To check the variability in the environmental condition during measurement time, we used a Thermo/Hygrometer – Equinox, EQ 310 CTH. The average temperature observed during all four experiments were (mean±sd) pre 29.10±1.06 ºC and post 29.20±2.39 ºC and humidity pre 59% and post 59%.

Table-15 Pre and post results at both psycho-physiological and physiological levels

Levels	Variables	Pre Mean±sd	Post Mean±sd	*t*-value	*p*-value
	AC	3.28±1.21	2.56±0.60	5.75	<0.001***
without filter	IAL	-0.002±0.24	0.11±0.15	-3.78	<0.001***
	IAR	-0.01±0.21	0.10±0.16	-4.57	<0.001***
	IEL	1.88±0.17	1.84±0.15	1.86	0.07
	IER	1.85±0.24	1.88±0.17	-1.05	0.30
with filter	IAL	0.39±0.16	0.39±0.12	-0.14	0.89
	IAR	0.39±0.15	0.39±0.13	-0.04	0.96
	IEL	1.91±0.15	1.95±0.15	-1.92	0.06
	IER	1.94±0.15	1.94±0.15	-0.21	0.83

Abbreviations: AC, Activation Coefficient; IAL, Integral Area Left side; IAR, Integral Area Right side; IEL, Integral Entropy Left side; IER, Integral Entropy Right side. Significant level, ****p*<0.001

The observations in all four experiments showed a decreasing trend of AC, increase in IA left and right and decrease in IE left. Whereas, IE right was found increasing in three of four experiments and decreased only in one experiment. This suggests that there exist a reproducibility of stress reduction and health improvement through Integrated Yoga Practices. **Table-15** presents results from all four groups combined into one, where the decrease in AC value turned highly significant (p<0.001, d=0.59). The results at the psycho-physiological level showed a highly significant increase in both IA left and right (IA left p<0.001, d=0.39 and IA right p<0.001, d=0.48). The IE left values decreased from higher to lower (IE left 1.88±0.17, to 1.84±0.15, p=0.07, d=0.18) but not significantly. The mean values of IE right side shifted towards higher, but marginally not significantly (IE right 1.85±0.24 to 1.88±0.17, p=0.30, d=0.1). Whereas, the results at the physiological level were found very stable except IE Left, which showed a shift of a marginal increase within the normal range. These results are evidence of sustaining the energy homeostasis level through yoga practices, which helps in maintaining health of the practitioners.

Table-16 Both groups demonstrated significant reduction in stress levels and significant improvement in general health index after IYM at the psycho-physiological level. However, integral entropy parameter at (NF) level did not demonstrate any change. At physiological level, IE right side decreased significantly in the male group, whereas it significantly increased in the female group. Other parameters at the physiological level in both the groups did not show significant changes.

Table-17 the baseline comparisons between both groups showed higher mean values of AC in females than males (AC, females 3.55±1.36 and males 3.09±1.06, $p=0.06$). The magnitude of mean values of IA left and IA right side (NF) readings were found significantly higher in males (IA left $p<0.001$ and IA right $p<0.01$) than females, whereas, no significant difference was found from IE left and IE right values between the groups. Further, the magnitude of IA left and IA right values (WF) were significantly higher in males than females (IA left $p=0.04$ and IA right $p=0.02$). However, no significant difference was found from IE left, and IE right (WF) in between the genders.

To check the improvement on gender basis, post of male and female' subgroups comparison were made. The findings indicated that both subgroups improved after the interventions except IE right (WF) parameter, which showed a significant shift towards higher values in the females group, though this increase was in the normal range of the entropy parameter.

Table – 16 Pre and post results of sub-groups at both psycho-physiological and physiological levels

Levels	Variables	Pre Male	Post Male	*t*-value	*p*-value	Pre Female	Post Female	*t*-value	*p*-value
		Mean±sd (n=55)	Mean±sd (n=55)			Mean±sd (n=39)	Mean±sd (n=39)		
	AC	3.09±1.06	2.58±0.55	3.25	0.002**	3.55±1.36	2.52±0.66	5.13	<0.001***
without filter	IAL	0.07±0.19	0.13±0.13	-1.96	0.05*	-0.11±0.25	0.07±0.16	-3.36	0.002**
	IAR	0.04±0.19	0.12±0.15	-2.71	0.009**	-0.08±0.21	0.08±0.16	-3.78	<0.001***
	IEL	1.88±0.17	1.83±0.16	1.66	0.10	1.88±0.17	1.85±0.14	0.90	0.37
	IER	1.85±0.22	1.90±0.18	-1.10	0.27	1.84±0.27	1.85±0.17	-0.27	0.79
With filter	IAL	0.42±0.13	0.42±0.11	0.25	0.80	0.35±0.20	0.36±0.13	-0.31	0.76
	IAR	0.43±0.12	0.41±0.11	0.91	0.36	0.35±0.19	0.37±0.15	-0.58	0.57
	IEL	1.92±0.14	1.95±0.16	-1.19	0.24	1.89±0.15	1.95±0.14	-1.53	0.13
	IER	1.96±0.15	1.91±0.15	2.35	0.02*	1.92±0.16	1.99±0.14	-2.35	0.02*

Abbreviations: AC, Activation Coefficient; IAL, Integral Area Left; IAR, Integral Area Right; IEL, Integral Entropy Left side; IER, Integral Entropy Right side. Significant level, **p*<0.05, ***p*<0.01, ****p*<0.001

Table-17 Cross sectional results (between males and females) at both psycho-physiological and physiological levels

Levels	Variables	Pre Male mean±sd (n=55)	Pre Female mean±sd (n=39)	*t*-value	*p*-value	Post Male mean±sd (n=55)	Post Female mean±sd (n=39)	*t*-value	*p*-value
	AC	3.09±1.06	3.55±1.36	1.88	0.06	2.58±0.55	2.52±0.66	-0.47	0.64
without filter	IAL	0.07±0.19	-0.11±0.25	-3.67	<0.001***	0.13±0.13	0.07±0.16	-2.06	0.04*
	IAR	0.04±0.19	-0.08±0.21	-2.93	<0.01**	0.12±0.15	0.08±0.16	-1.26	0.21
	IEL	1.88±0.17	1.88±0.17	-0.12	0.90	1.83±0.16	1.85±0.14	0.36	0.72
	IER	1.85±0.22	1.84±0.27	-0.24	0.81	1.90±0.18	1.85±0.17	-1.29	0.20
With filter	IAL	0.42±0.13	0.35±0.20	-2.10	0.04*	0.42±0.11	0.36±0.13	-2.28	0.02*
	IAR	0.43±0.12	0.35±0.19	-2.38	0.02*	0.41±0.11	0.37±0.15	-1.66	0.10
	IEL	1.92±0.14	1.89±0.15	-0.78	0.44	1.95±0.16	1.95±0.14	-0.11	0.91
	IER	1.96±0.15	1.92±0.16	-1.23	0.22	1.91±0.15	1.99±0.14	2.90	0.005**

Abbreviations: AC, Activation Coefficient; IAL, Integral Area Left; IAR, Integral Area Right; IEL, Integral Entropy Left side; IER, Integral Entropy Right side. Significant level, *p<0.05, **p<0.01

CHAPTER – 8.0

DISCUSSION

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8.0 DISCUSSION

8.1 NORMATIVE STUDY

The aim of the study was to develop EPI norms for healthy Indian population and to investigate whether EPI norms differ from European population based on gender, age and diet factors. The present findings show that Integral Area, left and right (general health parameter) at both physiological and psychophysiological levels in the Indian population are different from the EPI norms for the European population. However, Activation Coefficient (stress levels) and Integral Entropy, left and right (disorderliness in energy pattern) at both physiological and psycho-physiological levels were similar to the European norms. Further, a similar trend was also observed in the subgroup analysis of gender, age and diet. The findings showed that only IA left and right side are different at both physiological and psycho-physiological level, whereas AC and IE left and right at both physiological and psycho-physiological level were almost similar to the EPI norms for the European population.

Table 5 shows that 25th and 75th percentile values for the Integral Area left and right side are more than 1.96 Z score (cut off score for two tailed condition) for both with-filter (physiological) and without-filter (psycho-physiological) conditions. This shows a clear difference from existing norms for the European population. Therefore, both IA left and IA right should be considered different from the European norms and should be noted carefully while interpreting the results from an Indian population. The European norms for IA left and right are -0.6 to +1 (Bundzen & Korotkov, 2002). This given range for EU population is same for both with-filter and without-filter measurements. The observed norms of the Integral Area in Indian population for with-filter and without-filter readings are considerably different. These are the 25^{th} percentile and 75^{th} percentile for with-filter readings of [IAL, 0.28 to 0.50] and [IAR, 0.29 to 0.51]. The 25^{th} percentile and 75^{th} percentile for without-filter readings are as shown [IAL, -0.10 to 0.21] and [IAR, -0.07 to 0.21]. This indicates that the with-filter condition (physiological) and without-filter condition (psycho-physiological) of measurements and their normal ranges are also different. Therefore, the two different conditions of measurements, namely with-filter and without-filter values, should be used separately for comparisons in Indian population.

The 25^{th} and 75^{th} percentile values for the Integral Entropy (IE) left and right sides were found less than 1.96 Z score at both with-filter and without-filter conditions. Therefore, both IE left and IE right values are not different from the European norms. However, the 25^{th} percentile values in both conditions of the measurements for IE left and right were found to be considerably different. These should also be given consideration during comparing IE left and right values for both with and without filter conditions in Indian population, as they were found to be quite narrower in comparison to European norms.

The observed 25^{th} and 75^{th} percentile values for activation coefficient showed less than 1.96 Z score. Therefore, it can be concluded that AC values of Indian population do not differ much from the established norms of the EU population; however the observed percentile range of AC [2.27 to 3.41] for Indian population were found to be narrower in comparison to the AC range [2 to 4] for European population.

Discussion from subgroup analyses

The subgroup analyses on the basis of gender, age and diet also showed similar trends as found in the overall analysis. However, the percentile values for IA left and right, for both with-filter and without filter, between male and female subgroups were found considerably different from each other. These two conditions of measurements on the basis of gender should also be taken care of while interpreting the results. In the subgroups of age range between 18 to 40 and 41 to 60, the percentile values for AC and IA left and right at without-filter condition showed noticeable differences. Therefore, it is suggested that the age factor also should be taken into consideration while evaluating the results in research works. A similar trend was also observed in diet-based subgroup analysis. The percentile values for AC and IA left and right from without filter were marginally different, but not considered significant.

We suspect that the difference in the EPI norms between Indian population and European population may be because of variation in the life style, food pattern, and also the environmental conditions, which are important factors. We suggest for the future work that these factors could also be studied for understanding EPI patterns in health and disease conditions.

8.2 CYCLIC MEDITATION VS SUPINE REST

The three parameters used to compare the effect of CM and SR groups were AC (stress levels), IE on right and left side (entropy showing the level of disorderliness) and IA on right and left side (IA showing general health status of the managers).

The results showed the following:

1. Stress level in CM group reduced by 14.51% ($p = 0.005$) and no significant decrease of 7.21% ($p = 0.15$) in SR group.

2. Entropy parameter (disorderliness) right reduced by 3.76% ($p = 0.04$) and no significant change of 0.92% left side in CM group. In the SR group, there was more deterioration by 8.36% ($p < 0.005$) left side and no significant change of 1.1% on right side.

3. IA (health status) also showed a significant improvement 18.48% ($p = 0.05$) and 30.56% ($p = 0.03$) right and left sides in CM group. In SR group, there was a 23.29% increase on right side ($p = 0.02$) and no significant change of 3.03% on left side.

Activation coefficient (stress levels)

Earlier, a study has shown a 32.1% reduction in oxygen consumption after CM compared to 10.1% after SR (Telles, Reddy, & Nagendra, 2000). Another study has also shown the same trend of reduction in oxygen consumption of 19.3% in CM and 4.8% in SR group (Sarang & Telles, 2006). Another study with osteopathy treatment monitored through EPI technique in healthy volunteers found a significant reduction in AC parameter with percent change that ranged from 6% to 83% just after the treatment (Korotkov et al., 2012). The observations from our study have also found a similar decrease in stress level, where CM produced a highly significant reduction in AC with 14.51%, and nonsignificant in the SR group by 7.21%. This change is reflected in an increase of the EPI glow image area that could be due to the relaxation effect of meditation. In one of the pilot studies, EPI image glow area was found to have an inverse relationship (Hacker, Augner, & Pauser, 2011) with a sensitive stress marker, namely salivary alpha-amylase (sAA) (van Stegeren, Rohleder, Everaerd, & Wolf, 2006). It was found that during relaxation the EPI glow image area increased, whereas sAA decreased. It is well-known that when a person is under stress condition, the excitation of sympathetic nervous system causes constriction of blood vessels and increase in secretion of sweat fluids (Guyton & Hall, 2011) which inhibits electro photonic emission pattern, resulting in decreased EPI image glow area.

The findings from another study revealed that both focused (*Shamatha*) and distributed (*Vipassana*) attention meditation from the Theravada tradition produced an increase in HF and decrease in low-frequency (LF)/HF) components of HRV which enhances parasympathetic activation and is an indication of a relaxation response (Amihai & Kozhevnikov, 2014). Two days of CM program have also shown a reduction in LF and increase in HF of HRV components in 26 managers, which indicates a reduction in occupational stress level, suggesting a significant decrease in sympathetic activity (Vempati & Telles, 2000). The same observation of an increase in HF power through CM was also observed in another study (Sarang & Telles, 2006) suggesting an increase in vagal tone.

The findings of many researches on various meditation techniques explore relaxation response as one outcome of meditation. From this, we conclude that the reduction in AC is because of activation of the parasympathetic system, inducing relaxation and also a reduction of sympathetic activation through CM practice.

Integral entropy (disorderliness)

Earlier, a study with reconnective healing has shown a reduction in entropy value that suggest a significant harmonization of the subjects' conditions (Korotkov et al., 2009). Present study also showed same significant reduction in entropy values within CM group. This may be because of lowering in stress levels. It is postulated that any living organism produces negative entropy (Korotkov, 2011d) and reduces its own entropy using energy from the environment. Assimilation of energy from environment tends to be better with good mind body relaxation. This interaction with the environment reduces during stress condition causing an increase in entropy. Availability of Qi energy and its even distribution in organs is indicative of health as postulated in Chinese Medicine. Hence, a significant reduction in entropy values from higher to lower levels may be a sign of energy ordering in the human energy system. The exception to this observation is found in IE left side values that increased significantly within SR. This implies that SR practice may not be effective in bringing positive changes in entropy.

Integral area (general health status)

Meditation practices lead to positive health (Nagendra, 1988), improves concentration (Sarang & Telles, 2006), memory, and reduced anxiety (Subramanya & Telles, 2009a); all these lead to better psychophysiological health of the organism. The current study has shown a significant improvement in IA values within the CM group; however, similar significant change was found only for IA right side within SR group. In one of the previous studies, these IA values were found more in healthy people in comparison to patients with asthma (Alexandrova et al., 2002). From this, we may state that the improvement in IA parameter in the current study may be an indication of improvement toward good psychophysiological health.

Further, except IE left side, there were no significant group differences between CM and SR in the measured variables viz., AC, IE right and IA left side and IA right side.

The idea that why only SR was selected for the control group and not some other activity such as walking is because taking physical exercise may not be an appropriate control group for this study as the overall effect of CM (including the steps of asanas) is deeper relaxation, and on the contrary, walking or aerobics practices produces sympathetic arousal. Therefore, we did not consider controlling for the specific influence of asana component in CM using a control group doing physical exercise.

8.3 INTEGRATED YOGA MODULE

Though there are many researches on the effect and efficacy of yoga in the clinical area, the present study is a first research of its kind, which not only investigates the effect of the Integrated Yoga Module (IYM) in healthy people but also makes an attempt to find out whether EPI parameters differ gender wise and also to investigate the reproducibility of the EPI outcomes; therefore, four different experiments were performed.

The results showed a highly significant decrease in activation coefficient and highly significant improvement in the integral area left and right from without filter readings (psycho-physiological level) of participants after four weeks of IYM. There were almost similar changes within both males and females' subgroups analysis except for the IE right parameter (WF). Further, the baseline comparisons between the genders have also demonstrated the significant difference in IA left and right side from both without filter and with filter readings.

Psycho-physiological level

Activation coefficient (stress parameter)

A number of studies have evidence of the phenomenon that regular practice of integrated yoga reduces stress in various populations (Buffart et al., 2012; McDermott et al., 2014; Michalsen et al., 2012; Rao et al., 2008; Yoshihara, Hiramoto, Oka, Kubo, & Sudo, 2014). The results from the present study also show that integrated yoga practice on a regular basis reduces stress significantly

(p<0.001) in healthy people. This may be due to the yoga practices which work on autonomic nervous system (Streeter, Gerbarg, Saper, Ciraulo, & Brown, 2012) and restore balance between sympathetic and parasympathetic responses. Development of a coherence zone between both SNS and PNS responses may regulate, unify and correct the imbalances in the flow of *Prāṇa* in the body. This may be confirmed by the uniformity throughout the EPI glow image area which increases after the yoga practice. Earlier, this phenomenon was noticed in a pilot study by other researchers. It was found that during progression of relaxation the sensitive stress marker Salivary Alpha Amylase (sAA) (van Stegeren et al., 2006) decreased, whereas, the EPI image glow area increased (Hacker, Augner, & Pauser, 2011). It suggests that significant reduction in AC leads to prevention of any abnormality in the Pranic energy distribution which could lead to prevention of diseases.

Integral Area (IA, general health index)

It is well known that yoga components, i.e., physical postures, breathing techniques, meditation, cleansing techniques, and diet practices improve health and well-being in individuals (Buffart et al., 2012; Cabral, Meyer, & Ames, 2011; Gomes-Neto, Rodrigues-Jr, Silva-Jr, & Carvalho, 2014; Jagannathan, Nagarathna, Ramakrsihna, & Villacres, 2014). The present study also showed a highly significant increase in IA right (p<0.001) and left (p<0.001) which suggest improvement in general health of the participants. It may be due to reduction in stress level leading towards harmony and improved Pranic circulation, indicating improvement in psycho-physiological health.

Integral Entropy (IE, disorderliness)

The integrated practices of yoga improve and regulate the vital energy called *Prāṇa* (Sharma, Hankey, Nagilla, Meenakshy, & Nagendra, 2014b). Keeping harmonious homeostasis of this energy is a key essence of yoga practice, which keeps one healthy and promotes positive health (Nagarathna & Nagendra, 2009). Loss of homeostasis of the energy produces entropy, which is otherwise known as disorderliness in the human energy systems (Korotkov, 2002c) and high or low entropy may lead to diseases in the body. The shift of IE left higher to lower values and IE right toward higher may be an adjustment towards balance in both. It indicates better energy homeostasis through IYM, which is an indication of prevention of ill health.

Physiological level

Present study results at the physiological level have demonstrated the strength of regular practice of yoga, which helps in sustaining the homeostasis level of energy by keeping both mind and body in harmony. That is a unique outcome from the study suggesting that yoga is a boon for the health. The finding showed that the mean values of IA left, right and IE right was same before and after the IYM. Although, the IE left showed a shift marked by an increase within the normal range, but were negligible and not significant.

Gender-wise comparisons

Subgroup analysis of males and females showed a clear significant difference of energy parameters at the baseline. One of the previous studies reported that women experience more stress than men (Matud, 2004). The findings from our present study are also similar, showing that magnitude of the stress parameter is higher in females than males as found from the baseline comparisons of both males and females. After the intervention, both males and females group showed a significant reduction in stress level. It is a well-known fact that high-stress levels affect the health of individuals. According to a survey report done by American Psychological Association "women are more likely than men to report the stress-related health problems such as hypertension, depression, anxiety, and obesity" (Herscher, 2014). The present study findings showed significantly lower level of the IA values in females than males at the both physiological and psycho-physiological level in baseline comparison. This suggests that females are more susceptible to develop health issues than males. After the IYM, IA values showed significant improvement in both the groups, but the magnitude of improvement was more in females than males as compared with pre scores. Studies have reported that socioeconomic and cultural factors are common that influence the health of females, whereas the work responsibilities influence males (American Psychological Association, 2015; Stanton, 2001). Baseline comparisons of the IE, left and right values at both psycho-physiological and physiological levels indicated no difference between males and females. However, after the intervention IE right side (WF) decreased significantly in the male group indicating reduction in disorderliness, whereas, an exception of significant increase was observed in IE right values in the female group, but increase was within the normal range. Moreover, these findings suggest that the energy pattern differs on gender bases; hence, this needs to be studied separately with more data to substantiate the findings. *(In the next section we present the strength, limitations, implications, suggestions and conclusion of all three projects)*

CHAPTER – 9.0

APPRAISAL

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9.0 APPRAISAL

9.1 STRENGTH OF THE STUDIES

1. NORMATIVE STUDY

The present study could find out clear differences in the norms between the Indian and the European population. This difference was most evident in the Integral Area values. Apart from this, the study also demonstrated that EPI parameters are considerably different at various levels like with-filter and without-filter, males and females, two different sets of age ranges, and not the least, the diet.

2. CYCLIC MEDITATION VS SUPINE REST

A short-term intervention could produce a highly significant reduction in stress level within the CM group which was twice in comparison to reduction within the SR group and general health indices also showed significant improvement which is noteworthy features of this study.

3. INTEGRATED YOGA MODULE

The study found reproducible results of reduction in stress parameter, an increase in the health index, and decrease in disorderliness in all four experiments except IE right. The study also found a highly significant reduction in stress parameter and highly significant improvement in health indices due to Yoga-related lifestyle changes. In addition, the study examined the significant difference in the energy parameters at baseline comparisons between males and females. These are the strengths of the study.

9.2 LIMITATION OF THE STUDIES

1. NORMATIVE STUDY

The limitations of the study were self-reported healthy subjects and unequal numbers of males and females.

2. CYCLIC MEDITATION VS SUPINE REST

The data were collected from different batches of SMET program conducted in different periods on two occasions, namely morning and evening and this study limits to males only. Various components of CM could not be studies and though these limitations may partially reduce external validity, we estimate that these would be within acceptable range and can be controlled in future studies.

3. INTEGRATED YOGA MODULE

Absence of a control group may have posed a threat to the internal validity of the study; however, we estimate that this would at the maximum obscure the measured magnitude of the effects but not the direction of effect. A further confirmatory study may be done to better estimate the effect sizes.

9.3 IMPLICATIONS OF THE STUDIES

1. NORMATIVE STUDY

The observed differences in IA left and right values in Indian population will help arrive at more accurate values for research and clinical practices using EPI in India. This will also help in assessing a person's health status more reliably in real time.

Information with filter provides the present health status of a person, whereas information without filter indicates possible upcoming health related issues well in advance (Kostyuk et al., 2011). Corrections in IA values are necessary as this will enable us to differentiate between the energy pattern of healthy and unhealthy persons in specific groups of people more precisely.

2. CYCLIC MEDITATION VS SUPINE REST

This will help to understand role of individual components of CM. Importantly, this study is seen as a harbinger of other studies to be undertaken to correlate the EPI parameters with Qi, which is the subtle energy circulating in the organs and systems of the body. Qi is equivalent to prana in Ayurveda and Yoga and hence, this study is seen as fundamental in establishing the above correlations. If it is indeed so as postulated here, then EPI could turn out to be an important method for health maintenance and for predicting the onset of a disorder before manifesting in the physical system. Thus, the present study, though at nascent level, is thought to be fundamental for establishing the capability of this instrument as delineated above, further studies and more evidences are needed to take this idea clinically.

3. INTEGRATED YOGA MODULE

IYM can be implemented for the prevention of ill health and promotion of health in individuals.

9.4 SUGGESTIONS FOR FUTURE STUDIES

1. NORMATIVE STUDY

We also suggest that for future studies, the sensitivity and specificity of these proposed norms may be checked by suitably choosing the target samples.

2. CYCLIC MEDITATION VS SUPINE REST

Though the results are well-supported by the previous studies, it would be further interesting to explore by including other objective variables. These could be HRV or relevant biochemical tests, viz., salivary alpha amylase and cortisol etc. along with EPI assessment to correlate the findings of CM meditation on stress levels in individuals. Specific effect of various components of CM like asanas can also be studies in future.

3. INTEGRATED YOGA MODULE

From the findings of significant difference in energy trend between the males and females, it is suggested that males and females should be studied separately. Further, it is also suggested that future study should attempt to follow the subjects after the completion of study in order to find out prolonging effects of yoga practices.

9.5 CONCLUSION

1. NORMATIVE STUDY

EPI norms for healthy Indian population are different from the European norms, especially for the EPI parameter, Integral Area. All the subgroup results also showed similar differences in Integral Area left and right parameters from European norms. Further, the study also found considerable differences between the various subgroup factors like gender, age range and diet. This suggests that any study being carried out on Indian population should consider all these vital factors carefully while analysing and interpreting the results.

2. CYCLIC MEDITATION VS SUPINE REST

The investigations from the current study contributed evidence to conclude that the CM practice reduces stress and improves psychophysiological health indices better than SR in managers. It further gives evidence to the possibility of monitoring Qi (and perhaps prana) in the organ systems of the body.

3. INTEGRATED YOGA MODULE

Present study achieved the reproducible results for stress, general health and disorderliness in all four experiments at the psycho-physiological level except IE right side. Outcomes of the study also suggest that the energy parameters differ gender-wise; hence, this needs to be studied separately with more data to substantiate the findings. Further, the findings from the investigations also suggests that IYM can be used to regulate, improve and sustain the energy homeostasis of an organism. This, in essence, is important in the field of prevention and sustenance of health.

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APPENDICES

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Appendix - 1) TABLE 18: INTEGRATED YOGA MODULE

SN	**Contents**
1	Introduction to Yoga and its Streams
2	Life and Message of Spiritual Masters& Indian Culture
3	*Kriyā, Āsana, Prāṇāyāma, Dhyāna* – Practice & Presentation
4	Karma *Yoga*,*Maitri Milana*,*Kīrtana*, Krīḍa Yoga & *Ānanda Sabhā*

Appendix - 2) TABLE 19: TIME TABLE OF IYM

TIME	PARTICULARS	Venue
5. 00 am – 6.00 am	*Uṣāsvasti* (Wake Up), *Snanam & Śaucam* (Bath & Wash)	In Respective Rooms
6.00 am to 7.30 am	*Prātaḥ-Smaraṇam, Yogāsana Abhyāsa, Prāṇāyāma & Omkār Dhyāna.*	Tapas Hall
7.30 am to 8.00 am	*Upahāra* (Break Fast)	Dining Hall
8.15 am to 8.45 am	*Maitri Milan*	*Mangala Mandira*
8.45 am to 9.45 am	*Karma Yoga*	GroupWise
10.00 am to 11.00 pm	*Upanyāsa* (Lecture Session 1)	Tapas Hall
11.00 am to 12.00 pm	Self-Study/Worksheet/Report Writing or Happy Assembly Preparation	Tapas Hall
12.00 pm to 01.00 pm	8 step Teaching Technique (*Yogāsanas*)	Tapas Hall
1.00 pm to 2.00 pm	*Bhojanam* (Lunch)	Dining Hall
2.00 pm to 2.55 pm	Rest and Library	Rooms or *Pātañjali* Hall
3.00 pm to 4.00 pm	Cyclic Meditation	Tapas Hall
4.00 pm to 5.00 pm	*Upanyāsa* (Lecture Session 2)	Tapas Hall
5.00 pm to 5.55 pm	Milk / Malt Break & Tuning to Nature	Dining Hall
6.00 pm to 6.30 pm	*Bhajan Sandhyā* (Devotional Session)	*Prārthanā Mandira*
6.30 pm to 7.30 pm	*Upanyāsa* (Lecture Session 3) or Trataka	*Mangala Mandira*
7.30 pm to 8.15 pm	*Rātri Bhojanam* (Dinner)	Dining Hall
8.15 pm to 10:00 pm	Self-Study & *Niṣā Svasti* (Good Night)	In Respective Rooms

Appendix - 3) TABLE 20: CYCLIC MEDITATION

SN	CYCLIC MEDITATION	DURATION
1	Opening Prayer –Āvartana Dhayāna Mantra	1 min
2	Instant Relaxation Technique	1 min
3	Centering	3 min
4	Standing Posture - Ardhakaṭicakrāsana	3 min
5	Quick Relaxation Technique	5 min
6	Sitting Postures - Vajrāsana, Śaśāṁkāsana, Uṣṭrāsana	5 min
7	Deep Relaxation Technique	15 min
8	Closing Prayer	2 min

Appendix - 4)

SOCIO DEMOGRAPHIC DATA SHEET

Swāmī Vivekananda Yoga Anusandhāna Saṁsthāna

Name..

Dates of Birth (........./.........../.....................**)**

Age [ ] Gender : Male [ ], female [ ]

State…………………………………………………………..…………………………………..

Educational Qualification...

Height..**weight**...

Are you having any health problem? Yes/No, **Specify**..

Any other..

Are you on medications? Yes/No,

When did you take medications last time? (..)

Diet pattern: A. Vegetarian, B. Non-vegetarian, C. Mixed

Any habits: A. Smoking, B. Alcohol, C. Tobacco, D. Tea, E. Coffee or any other.........................

Email: ....

Contact number……...

Appendix - 5)

INFORMED CONSENT

Swāmī Vivekananda Yoga AnusandhānaSaṁsthāna

You are being invited to participate in the research related event which is being conducted at S-VYASA University Bangalore, and it is likely to be beneficial to the society.

Title of the study: "Efficacy of Integrated Yoga Practices on healthy people using Electro Photonic Imaging Technique"

Purpose of the study:

1. To establish the EPI norms for Healthy Indian Population
2. To study the effect of yoga interventions on healthy people using EPI technique

Principal Investigator: Kuldeep Kumar Kushwah, PhD scholar, SVYASA University (Mo: 8884922002)

Investigators

1. Professor TM Srinivasan (Ph.D., D.Sc.)

2. Dr. HR Nagendra (Ph.D., D.Sc.)

Interventions

Integrated Yoga Module.

Cyclic Meditation VS Supine Rest.

SAFETY ISSUES:

About the instrument: The instrument EPI/GDV by which your measurement will be taken is non-invasive and hence there won't be any harm to you. You have all rights to withdraw yourself from the study at any time of the study. There will not be any charge for your participation, and confidentiality of your details will be maintained.

The procedure and purpose of the experiment was explained to me and I have understood about the test, study and my all rights to participate in the trial hence, I am giving my consent for becoming a subject.

Signature of the Witness **Signature of the Participant**

Date __/___/_____

Appendix -6)

स्वामी विवेकानन्द योग अनुसंधान संस्थान

Swami Vivekananda Yoga Anusandhāna Samsthāna

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

Eknath Bhavan, # 19, Gavipuram Circle, Kempegowda Nagar, Bangalore - 560 019

Ph: 080 - 2661 2669, Telefax: 080 - 2660 8645

E-mail: svyasa@svyasa.org Website: www.svyasa.org

RES/IEC-SVYASA/31/2014

October 09, 2014

To,
Prof. TM Srinivasan,
Dean,
Division of Yoga and Physical Sciences,
S-VYASA University,
Bangalore

Reference:

"Development of normative data and effect of yoga based techniques on electro photonic imaging parameters" - Committee Approval of the above mentioned study

Dear Prof. TM Srinivasan,

We have received from you the following study related documents vide your letter dated June 17, 2014

1	Project Proposal
2	Informed consent form

Ethics committee meeting was held on July 20, 2014 at 10 am to 1:00 pm at Eknath Bhavan, Bangalore. Above documents were examined and discussed in the meeting. After due consideration, the committee has decided to approve conducting the aforementioned study.

APPROVED

N.S. Venkatesh

INSTITUTIONAL ETHICS COMMITTEE
SVYASA, BANGALORE

स्वामी विवेकानन्द योग अनुसंधान संस्थान
Swami Vivekananda Yoga Anusandhāna Samsthāna
(Declared as Deemed-to-be University under Section 3 of the UGC Act, 1956)
Eknath Bhavan, # 19, Gavipuram Circle, Kempegowda Nagar, Bangalore - 560 019
Ph: 080 - 2661 2669, Telefax: 080 - 2660 8645
E-mail: svyasa@svyasa.org Website: www.svyasa.org

This is to confirm that neither Prof. TM Srinivasan, nor any study staff participating in this study were involved in the voting procedures and decision making.

The institutional Review Board / Independent Ethics Committee (IEC) are expected to be informed about the progress of the study / any changes in the protocol and patient information / informed consent. The investigators are also expected to submit a copy of the final report to IEC for records.

This approval is valid up to the completion of the study at the site.

Please submit to the IEC, the status report of the study as per &. SOPs.

The IEC is organized & operates according to the requirements of ICH – GCP, Indian Council of Medical Research guidelines & Schedule Y.

Best Wishes,

R.S. Venkatesh

R.S. Venkatesh,
Member Secretary,
Institutional Ethics Committee,
S-VYASA, Bangalore.

Appendix 7)

RAW DATA (NORMATIVE DATA, n=880)

	DEMOGRAPHIC DETAILS							*WITH FILTER*				*WITHOUT FILTER*			
ID	**GENDER**	**MAR STA**	**EDU QUA**	**HT (CM)**	**WT (KG)**	**BMI** (Kg/m^2)	**AC**	**IAL**	**IEL**	**IAR**	**IER**	**IAL**	**IEL**	**IAR**	**IER**
541	M	M	B	170.0	82	28.37	2.53	0.64	2.06	0.67	2.02	0.35	1.63	0.37	2.11
542	M	M	B	165.0	82	30.12	3.67	0.59	2.06	0.47	1.76	0.04	1.91	0.06	2.07
544	M	M	C	178.0	83	26.20	3	0.61	1.92	0.62	2.1	0.16	1.39	0.3	1.81
545	M	M	A	173.0	66	22.05	6.55	0.4	1.85	0.55	1.94	-0.32	1.81	-0.81	2.1
546	M	M	A	170.0	90	31.14	4.83	0.54	1.87	0.5	1.55	0.06	1.83	-0.49	1.62
548	M	M	A	158.0	80	32.05	3.91	0.6	1.97	0.51	1.87	0.04	1.81	0.08	1.89
549	M	M	B	173.0	75	25.06	2.07	0.64	2.17	0.53	1.95	0.36	1.98	0.43	2.09
550	M	M	C	180.0	85	26.23	6.01	0.43	2.03	0.49	1.66	-0.31	1.87	-0.52	1.86
551	M	M	A	NA	NA	NA	4.66	0.58	1.85	0.62	1.98	-0.23	1.77	0.12	2.04
552	M	M	A	173.0	63	21.05	2.38	0.41	2.03	0.42	2.05	0.17	1.75	0.2	1.85

553	M	M	A	162.0	72	27.43	4.54	0.66	2.08	0.6	2.21	0.01	1.57	0.08	1.51
554	M	M	C	172.0	84	28.39	2.33	0.3	1.62	0.59	2.1	0.24	1.67	0.26	1.77
555	M	M	C	170.0	80	27.68	2.22	0.42	1.97	0.52	1.87	0.18	1.86	0.3	2.08
556	F	M	A	162.0	50	19.05	2.15	0.48	2.02	0.57	2.08	0.29	1.84	0.34	1.44
558	M	M	A	173.0	96	32.08	3.45	0.42	2.18	0.39	2.11	0.01	1.9	0.09	1.44
559	M	M	B	178.0	79	24.93	2.31	0.47	2.03	0.55	2	0.26	2	0.25	1.65
561	M	NA	A	170.0	72	24.91	2.51	0.33	2.14	0.34	1.97	0.04	1.89	0.15	1.67
562	M	M	A	168.0	63	22.32	1.98	0.42	1.54	0.5	1.95	0.29	1.98	0.25	1.83
565	M	M	A	173.0	79	26.40	4.61	0.41	2	0.41	2.08	-0.12	1.96	-0.2	1.78
566	M	M	A	158.0	NA	NA	2.06	0.45	2.12	0.33	1.92	0.17	1.89	0.2	2.12
568	M	M	B	168.0	74	26.22	1.67	0.43	1.95	0.34	1.9	0.24	1.89	0.2	1.94
569	M	M	A	168.0	62	21.97	2.18	0.47	1.59	0.49	1.77	0.28	1.53	0.22	1.51
570	M	M	A	160.0	55	21.48	6.76	0.47	1.87	0.63	2	-0.63	1.81	-0.25	1.81
571	M	M	B	180.0	68	20.99	3.16	0.52	2.05	0.37	1.62	0.04	1.9	0.04	1.73
573	M	M	B	NA	NA	NA	3.74	0.52	1.88	0.44	1.89	-0.03	2.05	-0.05	1.66

574	M	M	A	162.0	74	28.20	2.6	0.48	1.94	0.46	1.77	0.16	2.16	0.22	1.89
575	M	NA	A	180.0	79	24.38	1.46	0.39	2.03	0.33	2.04	0.22	1.91	0.23	2.03
576	M	M	A	167.0	73	26.18	2.12	0.42	1.83	0.4	2	0.25	1.76	0.16	1.98
579	M	NA	C	NA	NA	NA	1.91	0.35	1.99	0.4	1.82	0.17	2.02	0.22	1.64
580	M	M	B	NA	NA	NA	2.61	0.52	2	0.54	1.7	0.17	1.9	0.25	1.32
582	M	M	C	NA	NA	NA	2.3	0.54	2	0.54	2	0.26	2.06	0.33	2.08
584	M	NA	A	NA	NA	NA	4.36	0.46	1.91	0.46	2.08	0.12	2	-0.21	1.73
585	M	UM	A	173.0	68	22.72	2.56	0.34	1.66	0.26	1.6	-0.11	1.86	0.19	2.11
586	M	M	A	155.0	50	20.81	2.29	0.29	1.8	0.31	1.92	0.08	1.8	0.11	1.81
588	M	UM	A	170.0	64	22.15	2.9	0.48	2.08	0.45	1.81	0.1	1.79	0.09	1.83
591	M	M	A	168.0	71	25.16	2.79	0.53	1.74	0.52	1.8	0.14	1.96	0.22	1.98
593	M	NA	A	159.0	56	22.15	3.7	0.48	2.04	0.48	2.17	-0.07	1.8	0.11	1.35
594	M	M	B	NA	NA	NA	2.49	0.51	2.18	0.59	1.87	0.27	1.78	0.25	1.48
595	M	M	B	165.0	NA	NA	2.35	0.36	2.04	0.34	1.98	0.11	1.4	0.17	1.73
596	M	NA	A	162.0	58	22.10	6.28	0.26	1.91	0.34	1.93	-0.87	2.07	-0.44	2

597	M	M	C	160.0	75	29.30	2.43	0.51	2	0.52	1.9	0.23	2.09	0.26	1.89
598	M	M	B	174.0	77	25.43	2.4	0.34	1.94	0.3	1.97	0.1	1.63	0.02	1.8
599	M	M	B	140.0	51	26.02	2.49	0.42	1.89	0.25	1.77	0.05	1.92	0.02	1.89
600	M	M	B	173.0	82	27.40	3.65	0.61	1.99	0.59	2.08	0.28	1.98	-0.03	1.77
601	F	M	B	NA	NA	NA	2.31	0.54	1.91	0.49	1.83	0.29	1.95	0.24	1.86
602	M	M	C	164.0	74	27.51	1.58	0.51	2.01	0.63	2	0.42	1.97	0.42	1.88
482	M	UM	C	165.0	65	23.88	2.35	0.06	1.9	0.15	1.71	-0.23	1.96	-0.07	2.06
483	M	M	NA	171.0	76	25.99	2.6	0.46	2.2	0.42	2.17	0.15	1.66	0.11	2.03
484	M	NA	C	167.0	71	25.46	3.23	0.36	1.63	0.41	1.63	-0.06	1.79	0	1.87
485	M	M	A	NA	NA	NA	2.27	0.53	2.1	0.5	1.98	0.26	1.69	0.3	1.97
488	M	M	A	NA	59	NA	2.1	0.39	2.03	0.36	1.83	0.17	1.62	0.15	1.65
489	M	M	NA	160.0	67	26.17	2.73	0.43	1.79	0.44	2	0.09	1.89	0.13	1.75
490	M	M	NA	189.0	94	26.32	1.62	0.35	1.96	0.35	1.89	0.21	2.02	0.2	1.6
491	M	UM	NA	NA	85	NA	2.72	0.44	1.93	0.53	2.14	0.15	1.5	0.2	1.69
495	M	M	B	160.0	63	24.61	2.66	0.35	2.08	0.36	2.1	0.05	1.98	0.05	1.91

496	M	M	NA	164.0	74	27.51	3.87	0.26	1.87	0.32	1.81	-0.22	1.97	-0.2	2.05
497	M	M	A	NA	70	NA	2.49	0.35	1.87	0.38	2.06	0.06	1.72	0.12	2.05
498	M	M	C	162.0	63	24.01	2.28	0.41	2.15	0.36	1.89	0.14	1.91	0.16	1.85
499	M	UM	A	160.0	57	22.27	2.48	0.43	1.77	0.48	2.09	0.17	1.96	0.21	2.03
500	M	UM	A	NA	NA	NA	2.97	0.39	1.94	0.38	2.08	0.1	1.81	0.09	1.73
501	M	M	A	172.0	67	22.65	2.38	0.41	1.94	0.46	2.08	0.16	1.73	0.22	1.97
502	M	M	A	162.0	69	26.29	4.06	0.39	2.13	0.44	2.25	-0.18	1.83	-0.01	1.74
503	M	M	C	NA	NA	NA	1.81	0.46	2.06	0.39	1.94	0.24	1.86	0.27	1.8
504	M	M	C	NA	NA	NA	2.01	0.38	2	0.36	1.88	0.17	1.71	0.19	2.01
505	F	M	B	145.0	56	26.63	2.56	0.16	1.81	0.2	1.81	-0.11	2.08	-0.06	2.05
507	F	M	C	NA	NA	NA	2.36	0.3	1.94	0.36	2.09	0.04	2	0.11	1.92
508	M	M	A	180.0	68	20.99	2.59	0.44	2.13	0.51	2.02	0.18	1.86	0.16	1.69
509	M	M	A	NA	69	NA	1.97	0.43	2.13	0.36	2.04	0.21	1.82	0.19	2.07
510	M	UM	A	177.0	76	24.26	3.56	0.4	1.79	0.34	1.82	-0.15	1.81	0.12	1.72
511	M	UM	A	178.0	76	23.99	2.33	0.44	1.54	0.43	1.96	0.19	1.68	0.17	1.85

512	M	M	A	161.0	65	25.08	2.67	0.5	1.91	0.43	1.74	0.11	1.83	0.23	1.75
514	F	M	B	NA	57	NA	2.83	0.24	2.04	0.39	2.1	-0.11	1.85	0.09	1.97
515	M	M	C	162.0	73	27.82	2.17	0.34	1.88	0.35	1.51	0.06	1.79	0.22	2.01
516	M	UM	B	162.0	63	24.01	3.37	0.33	2.12	0.38	2.06	-0.11	2.04	0	2.07
517	M	M	C	170.0	64	22.15	2.19	0.3	2.06	0.19	1.91	0.02	2.02	0.06	1.92
519	M	UM	A	172.0	62	20.96	3.66	0.23	1.9	0.38	1.92	-0.33	2.11	-0.05	1.76
520	M	UM	A	165.0	57	20.94	2.57	0.28	1.94	0.33	1.9	0.02	1.65	0.08	1.92
521	M	M	C	170.0	88.3	30.55	2.09	0.38	1.94	0.39	2.1	0.19	2.06	0.15	1.9
522	M	M	B	170.0	65	22.49	2.15	0.4	2.12	0.47	1.76	0.23	1.87	0.22	2.03
525	M	UM	B	168.0	68	24.09	2.64	0.29	2.05	0.32	1.98	0	2.17	0.05	1.99
526	M	M	C	NA	NA	NA	3	0.38	2.17	0.37	1.94	-0.05	1.76	0.11	1.86
527	M	UM	C	NA	NA	NA	2.24	0.31	1.77	0.34	2	0.12	1.77	0.08	1.85
528	M	NA	B	168.0	63	22.32	2.67	0.33	1.63	0.41	1.75	0.01	1.94	0.13	1.9
529	M	M	C	170.0	67	23.18	1.84	0.3	1.91	0.25	1.78	0.07	1.89	0.14	2.08
530	M	M	C	167.0	85	30.48	2.87	0.08	1.94	0.16	1.62	-0.2	2.09	-0.23	2.14

531	M	UM	B	170.0	57	19.72	3.03	0.36	1.98	0.27	2.16	-0.18	2.08	0.07	1.91
532	M	M	B	162.0	60	22.86	2.74	0.33	1.28	0.41	1.68	-0.01	2.04	0.1	1.87
533	M	M	C	176.0	76	24.54	2.43	0.32	2.09	0.26	1.74	0.03	1.97	0.02	1.96
534	F	M	C	158.0	64	25.64	3.09	0.25	1.74	0.33	2.23	-0.09	1.95	-0.06	1.91
535	M	UM	B	170.0	59	20.42	2.59	0.31	1.97	0.37	1.98	0.05	1.99	0.05	1.89
537	F	NA	B	155.0	55	22.89	2.9	0.14	2.03	-0.03	1.75	-0.36	1.93	-0.21	2.07
539	M	UM	B	NA	NA	NA	2.14	0.19	2.21	0.22	1.84	0.01	1.87	0	1.98
444	M	M	A	173.0	78	26.06	2.39	0.75	2	0.75	1.91	0.38	2.08	0.57	2
445	M	M	A	168.0	75	26.57	3.52	0.82	1.79	0.9	2.15	0.27	2.02	0.62	2.03
447	M	M	A	166.0	67	24.31	2.38	0.76	2.12	0.66	2.16	0.49	2.12	0.46	2
449	M	M	B	168.0	65	23.03	6.25	0.68	1.75	0.68	1.93	-0.3	1.65	-0.18	1.56
450	M	M	A	NA	NA	NA	2.51	0.63	2.1	0.61	2.09	0.39	1.83	0.3	1.97
451	M	M	B	178.0	82	25.88	1.93	0.82	2.12	0.76	2.21	0.55	2.08	0.65	2.05
452	M	M	B	165.0	70	25.71	2.76	0.63	2	0.65	1.59	0.27	1.56	0.41	2.13
453	M	M	A	169.0	90	31.51	2.48	0.85	1.98	0.82	2.17	0.54	2	0.6	2.12

455	M	M	B	NA	NA	NA	2.85	0.93	2.14	0.89	2.11	0.61	1.79	0.53	1.56
456	M	M	B	155.0	82	34.13	2.51	0.8	1.91	0.83	1.7	0.51	2	0.55	2.15
457	F	M	A	NA	NA	NA	2.67	0.53	2	0.59	1.87	0.23	1.9	0.25	1.65
458	M	M	A	NA	65	NA	2.35	0.8	2.03	0.74	2.08	0.5	1.84	0.54	1.78
460	M	M	B	174.0	74	24.44	2.68	0.75	1.73	0.77	1.7	0.4	1.47	0.45	1.75
461	M	M	B	164.0	67	24.91	2.25	0.68	2.1	0.7	1.93	0.42	2.02	0.49	1.92
462	M	UM	B	NA	NA	NA	2.24	0.54	1.87	0.77	2.06	0.45	1.91	0.48	1.93
463	M	NA	B	NA	NA	NA	2.37	0.6	1.69	0.67	1.83	0.33	1.75	0.42	1.89
464	M	UM	B	165.0	64	23.51	2.21	0.62	2.02	0.58	1.67	0.37	1.89	0.36	2.06
465	M	UM	C	NA	90	NA	3.72	0.73	1.99	0.77	1.95	0.26	1.78	0.25	1.75
466	M	UM	B	166.0	45	16.33	1.47	0.47	1.86	0.45	1.94	0.34	1.82	0.32	2.07
467	M	M	B	173.0	NA	NA	2.15	0.66	2.04	0.63	1.96	0.39	1.96	0.5	2.23
470	M	M	B	165.0	78	28.65	3.76	0.81	2	0.71	1.84	0.23	1.67	0.22	1.76
471	M	M	NA	174.0	96	31.71	3.07	0.79	1.85	0.71	1.67	0.35	2.03	0.34	2.14
472	M	NA	A	163.0	60	22.58	2.24	0.63	1.85	0.6	2.01	0.38	1.8	0.39	1.89

474	M	NA	A	168.0	67	23.74	2.93	0.71	2.03	0.69	1.96	0.32	1.9	0.34	2
476	M	M	NA	175.0	60	19.59	3.05	0.75	1.84	0.75	1.98	0.37	1.9	0.44	2.08
477	M	M	B	164.0	68	25.28	2.29	0.52	2	0.46	1.88	0.3	1.38	0.2	2.07
478	M	M	A	163.0	62	23.34	2.87	0.66	1.81	0.76	1.96	0.3	1.93	0.42	2
479	M	M	A	165.0	62	22.77	2.33	0.67	2.17	0.66	1.88	0.42	1.96	0.49	1.89
480	M	M	A	180.0	84	25.93	2.47	0.76	2.1	0.76	2.12	0.52	1.95	0.47	2.02
604	M	UM	B	165.0	60	22.04	3.82	0.27	1.91	0.28	1.97	0.05	1.62	-0.44	2.15
605	F	M	B	155.0	52	21.64	2.88	0.29	2.02	0.25	1.92	-0.07	1.98	0	2.08
607	M	M	C	165.0	80	29.38	4.71	0.34	2.06	0.4	1.81	-0.06	1.59	-0.41	2
608	F	UM	C	158.0	45	18.03	2.5	0.32	1.89	0.25	1.97	0.01	2.16	0.02	1.98
610	F	M	C	155.0	46	19.15	3.31	0.42	2.03	0.39	1.85	0.08	2.04	-0.09	1.79
611	M	M	NA	178.0	88	27.77	2.19	0.32	1.72	0.39	1.74	0.08	1.68	0.18	1.83
613	M	M	B	173.0	73	24.39	2.57	0.4	2.12	0.25	1.71	0.08	1.63	-0.01	1.83
614	F	NA	B	168.0	57	20.20	2.75	0.37	1.74	0.45	2.23	0.08	1.72	0.09	1.9
616	M	M	B	NA	NA	NA	2.36	0.39	1.96	0.36	2.06	0.06	2	0.17	1.73

617	M	UM	C	180.0	63	19.44	3.71	0.37	1.92	0.39	1.65	-0.18	1.88	-0.01	1.68
618	M	M	A	168.0	66	23.38	1.59	0.41	2.02	0.36	1.85	0.24	1.92	0.24	1.72
619	F	M	A	160.0	65	25.39	2.22	0.14	2.17	0.17	1.9	0	1.92	-0.09	1.91
621	M	UM	C	NA	70	NA	2.57	0.33	1.88	0.39	2.04	0.02	1.81	0.12	1.65
623	F	UM	B	160.0	40	15.63	2.89	0.32	1.88	0.43	2.04	-0.04	1.93	0.09	1.99
626	F	M	B	158.0	58	23.23	2.14	0.46	2	0.45	2.02	0.26	1.94	0.23	1.73
628	F	M	B	162.0	52	19.81	3.15	0.37	1.97	0.39	2.04	-0.05	1.96	0.07	1.98
630	M	M	B	165.0	64	23.51	2.09	0.4	2.01	0.37	2	0.18	2.08	0.18	1.82
847	M	UM	C	160.0	55	21.48	3.73	0.2	1.76	0.31	1.77	-0.4	1.91	-0.03	1.94
848	M	UM	C	170.0	65	22.49	5.35	0.29	1.85	0.34	1.85	-0.3	1.91	-0.59	2.02
849	F	UM	C	160.0	55	21.48	3.9	0.38	2.1	0.37	1.64	-0.25	1.9	0.12	1.77
850	M	M	C	167.0	73	26.18	3.32	0.53	2	0.48	1.77	0.03	1.43	0.18	1.83
851	F	UM	C	168.0	50	17.72	3.11	0.33	2.01	0.28	1.72	0.14	1.94	-0.16	1.79
852	M	M	C	168.0	68	24.09	2.51	0.39	2.09	0.35	1.95	0.11	1.98	0.09	1.97
853	M	UM	C	167.0	65	23.31	3.02	0.35	1.62	0.35	2	-0.01	1.77	-0.03	1.9

854	F	UM	C	147.0	43	19.90	2.86	0.31	1.83	0.34	1.8	0.08	1.76	-0.1	1.9
855	F	M	C	158.0	51	20.43	2.26	0.34	2.02	0.3	1.91	0.1	1.67	0.1	1.93
857	M	UM	C	167.0	68	24.38	5.75	0.36	1.87	0.23	1.49	-0.54	2.06	-0.6	2.19
858	M	UM	C	165.0	68	24.98	2.36	0.27	1.78	0.28	1.93	0	1.94	0.11	1.77
861	M	UM	C	178.0	55	17.36	2.6	0.51	2.06	0.5	1.86	0.2	1.84	0.18	1.78
862	M	UM	C	170.0	58	20.07	3.22	0.04	2.06	0.18	2.11	-0.35	2.08	-0.16	2.17
863	M	UM	C	165.0	62	22.77	1.93	0.43	2.11	0.44	2.19	0.25	1.76	0.26	1.87
864	M	UM	C	162.0	66	25.15	4.62	0.59	2.12	0.59	1.98	0.1	1.41	-0.1	1.9
865	M	UM	C	180.0	66	20.37	3.15	0.26	1.87	0.15	2.04	-0.27	2.07	-0.1	2.04
867	M	UM	C	158.0	63	25.24	2.4	0.29	1.8	0.37	2.04	0.07	2.22	0.12	1.96
868	F	M	C	165.0	71	26.08	5.81	0.32	2.09	0.37	2.02	-0.59	2.19	-0.52	2.11
869	M	UM	C	165.0	49	18.00	3.27	0.49	2.18	0.45	2.09	0.22	1.94	-0.06	1.41
870	M	UM	C	168.0	72	25.51	2.19	0.45	1.8	0.45	2.06	0.24	1.7	0.22	1.85
871	M	UM	C	183.0	66	19.71	5.56	0.22	1.83	0.38	1.67	-0.46	2.17	-0.68	1.95
873	M	UM	C	168.0	67	23.74	3.97	0.53	2.09	0.51	2.1	0.01	1.32	0.01	1.24

875	M	UM	C	164.0	62	23.05	2.53	0.46	2.17	0.46	1.68	0.14	1.81	0.19	1.62
877	F	UM	C	178.0	50	15.78	2.48	0.26	1.5	0.35	1.81	0.04	1.68	0.03	1.93
631	M	M	C	175.0	85	27.76	1.7	0.4	1.97	0.35	2.02	0.2	2.09	0.22	1.49
632	M	M	B	170.0	89	30.80	2.27	0.42	2.04	0.41	1.57	0.17	1.81	0.17	1.37
633	M	M	C	NA	NA	NA	5.74	0.35	2.04	0.44	2.08	-0.87	2.17	-0.1	1.52
637	F	M	B	165.0	72	26.45	2.5	0.31	1.86	0.41	2.05	0.04	1.96	0.18	1.83
638	M	M	C	157.0	60	24.34	2.33	0.08	1.73	0.11	2.06	-0.05	2.12	-0.2	2.01
640	M	M	C	172.0	69	23.32	2.6	0.29	1.59	0.29	1.76	0	1.53	0.01	1.57
641	M	M	A	168.0	60	21.26	2.48	0.45	1.92	0.44	2.01	0.07	1.94	0.26	1.87
643	M	UM	NA	160.0	105	41.02	1.61	-0.09	1.98	-0.03	1.87	-0.23	2.19	-0.2	1.62
644	M	UM	B	178.0	75	23.67	2.47	0.42	1.87	0.44	2.16	0.14	1.81	0.15	1.98
645	F	M	C	165.0	51	18.73	2.09	0.39	1.86	0.34	1.93	0.17	1.89	0.15	1.74
647	F	M	C	152.0	60	25.97	2.31	0.35	1.73	0.37	1.84	0.06	2.05	0.18	1.81
648	M	M	C	168.0	64	22.68	2.36	0.35	1.94	0.45	2.02	0.15	2.06	0.14	1.87
649	M	UM	C	164.0	63	23.42	4.37	0.2	2.06	0.29	2	-0.51	1.87	-0.1	2.09

650	M	M	C	183.0	68	20.31	2.89	0.3	1.93	0.29	2	-0.08	1.94	0.02	1.96
651	M	M	B	NA	NA	NA	2.28	0.33	1.67	0.32	2.19	0.14	1.8	0.06	1.91
653	M	M	C	162.0	65	24.77	1.8	0.16	1.77	0.1	2	0.03	1.75	-0.12	2.09
656	M	M	C	178.0	64	20.20	1.46	0.35	2.04	0.44	1.68	0.21	1.9	0.32	2.17
657	F	M	C	168.0	61	21.61	2.25	0.25	1.89	0.27	1.7	0.07	1.91	0.03	2.03
658	M	UM	B	NA	NA	NA	2.82	0.33	1.75	0.41	1.86	-0.05	2.02	0.11	1.81
659	M	UM	C	170.0	75	25.95	2.17	0.33	1.94	0.37	2.01	0.12	1.91	0.17	1.7
660	M	M	B	NA	67	NA	1.83	0.4	1.99	0.4	1.99	0.23	2.18	0.21	1.74
662	F	M	B	158.0	90	36.05	1.48	0.28	1.71	0.3	1.76	0.12	1.88	0.18	1.73
1104	M	UM	B	175.0	96	31.35	1.35	0.31	2.21	0.27	1.55	0.14	1.82	0.2	2.19
1105	F	M	NA	147.0	65	30.08	1.75	0.14	2.01	0.03	1.87	-0.14	2.08	-0.01	1.49
1106	F	UM	C	171.0	70	23.94	1.59	0.39	2.02	0.34	2.05	0.2	2	0.23	1.75
1107	F	UM	B	155.0	70	29.14	3.79	0.31	1.91	0.3	1.56	-0.2	1.61	-0.06	1.42
1109	M	UM	C	158.0	55	22.03	2.39	0.37	2.11	0.4	1.85	0.17	1.7	0.1	1.96
1110	F	UM	C	162.0	55	20.96	2.33	0.35	1.53	0.36	1.83	0.09	1.71	0.14	1.97

1112	F	M	C	160.0	72	28.13	2.52	0.31	2.03	0.26	1.57	0	1.64	0.02	1.86
1113	M	M	B	162.0	63	24.01	2.89	0.54	2	0.52	2.19	0.17	1.71	0.2	1.9
1114	M	M	C	168.0	54	19.13	3.34	0.39	1.73	0.35	1.74	0.02	1.6	-0.07	2
1115	M	UM	C	169.0	65	22.76	2.39	0.48	2.09	0.55	2.03	0.28	1.81	0.23	1.89
1116	M	M	B	152.0	63	27.27	1.74	0.38	1.51	0.4	1.85	0.22	1.86	0.24	2.02
1118	F	M	B	160.0	58	22.66	2.27	0.26	1.94	0.36	1.72	0.08	2.11	0.06	1.95
1119	M	M	B	152.0	50	21.64	3.31	0.31	2.05	0.26	1.78	-0.14	2.07	-0.1	1.92
1121	F	M	C	162.0	55	20.96	2.22	0.27	2.05	0.11	1.74	-0.07	1.99	-0.02	2.06
1122	F	UM	A	152.0	50	21.64	1.43	0.24	1.89	0.21	1.79	0.09	1.96	0.1	2.06
1124	M	M	C	165.0	74	27.18	3.57	0.4	1.86	0.28	1.94	-0.16	1.91	-0.07	1.9
1125	F	M	C	162.0	69	26.29	1.76	0.62	1.87	0.54	2.02	0.46	2.2	0.36	1.58
1126	M	M	C	180.0	84	25.93	1.98	0.43	2.11	0.5	1.79	0.29	2.06	0.25	1.74
1129	F	UM	B	161.0	66	25.46	2.5	0.33	1.83	0.33	1.82	0.02	1.95	0.08	2.07
1134	M	UM	C	168.0	67	23.74	2.19	0.41	1.95	0.39	2.14	0.2	1.79	0.17	1.36
1135	M	UM	B	170.0	66	22.84	2.44	0.28	1.96	0.31	1.99	0.05	1.62	0.03	2.05

1068	F	UM	B	155.0	50	20.81	2.9	-0.17	1.7	0.14	1.6	-0.28	1.83	-0.3	1.73
1069	M	UM	C	173.0	59	19.71	4.36	0.38	1.8	0.2	1.43	-0.5	1.83	0.12	1.66
1074	M	M	B	158.0	67	26.84	6.19	0.38	1.85	0.48	1.98	-0.76	2.14	-0.48	1.98
1075	F	M	C	155.0	60	24.97	3.05	0.39	2	0.3	2.03	0.12	1.79	-0.02	1.57
1077	M	UM	B	173.0	60	20.05	4.76	0.65	1.95	0.7	1.75	-0.22	1.75	0.32	1.89
1078	M	UM	B	155.0	64	26.64	1.46	-0.18	1.85	-0.44	2.08	-0.05	1.78	-0.36	2.04
1079	F	UM	B	155.0	45	18.73	2.94	0.65	1.86	0.71	1.77	0.22	1.3	0.42	1.78
1080	M	UM	B	178.0	89	28.09	7.18	0.36	1.68	0.38	1.89	-0.24	2	-1.4	2.12
1081	M	UM	B	178.0	80	25.25	5.38	0.51	1.98	0.48	2.2	-0.2	1.72	-0.14	1.36
1082	M	UM	B	170.0	70	24.22	6.77	0.36	1.83	0.47	1.89	-0.64	2.12	-0.65	2.04
1083	F	UM	B	168.0	69	24.45	2.3	0.46	2.19	0.46	2.1	0.19	1.95	0.25	2.09
1084	F	UM	B	NA	45	NA	5.12	0.42	1.96	0.44	1.89	-0.04	1.87	-0.41	1.65
1085	F	UM	B	165.0	56	20.57	2.86	0.34	1.78	0.33	1.76	-0.02	1.64	0.08	1.87
1086	M	UM	B	165.0	59	21.67	2.75	0.22	1.81	0.42	1.79	-0.1	2.06	0.1	1.67
1089	M	M	C	165.0	79	29.02	1.66	0.42	1.74	0.42	2.02	0.29	1.63	0.22	2

1091	F	M	B	155.0	50	20.81	2.69	0.46	2.18	0.45	1.89	0.13	2.13	0.17	1.62
1092	F	UM	C	155.0	60	24.97	2.65	0.53	2.09	0.53	2.15	0.21	1.93	0.23	1.86
1093	M	M	C	NA	NA	NA	2.47	0.55	1.71	0.55	1.88	0.32	2.16	0.22	2.03
1094	M	UM	B	178.0	75	23.67	4.15	0.4	1.62	0.64	1.93	-0.27	1.66	0.22	1.96
1095	F	M	C	160.0	64	25.00	3.6	0.39	1.98	0.42	1.92	0.05	1.91	-0.15	2.05
1097	F	UM	B	160.0	50	19.53	3.52	0.31	1.55	0.31	2.06	-0.23	2.12	0.09	1.16
1098	F	UM	B	162.0	56	21.34	3.38	0.42	2.06	0.45	2.15	0.16	1.72	-0.04	1.71
1100	F	M	B	158.0	52	20.83	2.34	0.39	2.1	0.38	1.98	0.19	1.78	0.06	2.12
1101	F	M	B	160.0	60	23.44	2.53	0.6	2.13	0.55	2.14	0.27	2.06	0.28	2.08
1102	M	UM	B	168.0	60	21.26	2.21	0.33	1.93	0.42	2.05	0.22	1.6	0.11	1.82
668	F	UM	B	162.0	59	22.48	2.16	0.29	2.16	0.21	2	0.03	1.74	0.03	1.94
669	F	M	C	NA	76	NA	4.59	0.18	1.55	0.21	2.06	-0.47	2.03	-0.35	2.1
671	M	UM	C	158.0	58	23.23	3.05	0.23	1.97	0.17	1.91	-0.16	2.1	-0.12	2.12
675	F	UM	C	153.0	67	28.62	3.34	0.22	1.7	0.29	1.92	-0.14	2.06	-0.18	2.13
676	F	M	B	182.0	68	20.53	2.75	0.17	2.06	0.21	1.87	-0.16	1.98	-0.07	1.87

677	F	M	B	173.0	65	21.72	1.9	0.1	1.96	0.38	1.94	0.1	2.1	0.03	2.09
679	F	M	NA	158.0	64	25.64	2.46	0.19	1.99	0.17	1.87	-0.23	2	0.14	2.06
681	F	M	C	150.0	55	24.44	1.66	0.21	1.83	0.19	1.85	0.09	1.89	0.01	1.96
682	F	M	B	165.0	78	28.65	3.69	0.06	1.89	0.16	2.08	-0.36	1.94	-0.36	2.14
683	F	M	B	155.0	59	24.56	3.69	0.15	1.78	0.42	1.85	-0.07	1.67	-0.28	2.03
684	F	M	C	152.0	72	31.16	0.93	0.18	1.48	0.25	1.81	0.16	2.05	0.1	1.84
685	F	UM	C	160.0	72	28.13	1.69	0.04	1.94	0.02	1.83	-0.08	2.07	-0.16	2.02
686	M	UM	C	171.0	71	24.28	3.05	0.28	2.22	0.38	1.99	-0.06	1.74	-0.01	2
687	F	M	B	158.0	52	20.83	0.54	0.16	1.92	0.12	1.68	0.08	2.08	0.14	1.91
688	F	M	B	173.0	68	22.72	2.27	0.34	1.95	0.33	1.91	0.09	1.87	0.15	1.82
689	F	M	B	160.0	75	29.30	1.89	0.34	2.05	0.14	1.94	0.07	1.91	0.06	1.9
690	M	M	C	160.0	65	25.39	2.84	0.25	1.89	0.26	1.87	-0.2	2.12	0	1.95
694	M	M	B	170.0	69	23.88	2.63	0.36	2.1	0.27	1.7	0.06	1.35	-0.01	2.14
696	F	M	C	152.0	60	25.97	2.82	0.18	2.09	0.27	1.73	-0.12	1.92	-0.02	1.83
697	F	M	B	160.0	65	25.39	2.89	0.22	2.03	0.19	2	-0.13	1.59	-0.03	2

699	F	M	B	160.0	64	25.00	2.54	0.2	1.59	0.22	1.98	-0.1	1.99	-0.03	1.83
701	F	UM	C	160.0	60	23.44	2.76	0.16	1.79	0.19	1.8	-0.09	1.76	-0.14	2.19
702	F	M	A	170.0	50	17.30	3.43	0.24	2.03	0.2	1.74	-0.21	2.04	-0.18	2.11
704	F	UM	C	168.0	63	22.32	2.66	0.25	1.46	0.22	2	-0.08	1.98	-0.01	1.98
705	F	M	B	160.0	68	26.56	1.36	-0.02	1.82	0.05	1.72	-0.16	2.01	-0.05	1.68
706	F	M	B	163.0	67	25.22	2.93	0.31	1.88	0.32	1.83	-0.03	2	0	2.07
708	M	M	B	162.0	49	18.67	0.87	-0.11	1.73	0.1	2.06	-0.18	2.1	0.02	1.99
709	M	M	B	157.0	80	32.46	2.28	0.42	2.17	0.51	1.87	0.21	1.95	0.23	1.7
878	F	UM	B	162.0	60	22.86	2.95	0.21	1.83	0.3	1.96	-0.07	1.96	-0.09	1.73
879	M	M	C	173.0	65	21.72	2.19	0.31	1.64	0.33	1.91	0.13	1.76	0.1	1.46
880	M	M	C	178.0	75	23.67	3.68	0.42	2.25	0.44	2.13	-0.15	1.96	0.11	1.89
881	M	M	C	175.0	72	23.51	3.72	0.39	1.99	0.49	2.01	-0.09	1.93	-0.01	1.98
882	M	UM	B	170.0	72	24.91	4.14	0.35	1.98	0.34	1.93	-0.35	1.71	-0.02	1.96
883	M	M	C	170.0	55	19.03	2.95	0.19	1.81	0.28	1.98	-0.07	1.73	-0.12	1.77
884	M	M	C	162.0	NA	NA	3.04	0.3	1.58	0.29	1.94	-0.19	1.86	0.09	1.71

885	M	M	C	173.0	73	24.39	3.22	0.36	2.08	0.44	1.61	-0.01	2.08	0.03	1.4
886	M	M	A	170.0	71	24.57	2.44	0.4	1.81	0.51	2.17	0.16	2.09	0.2	1.77
887	F	M	C	160.0	59	23.05	2.63	0.29	1.59	0.38	2.23	0.03	1.88	0.03	2.11
888	F	M	C	165.0	80	29.38	2.65	0.37	1.97	0.43	2.07	0.01	1.79	0.16	1.86
890	F	M	B	162.0	53	20.20	2.75	0.37	2.06	0.33	1.91	0.01	1.96	0.01	2.12
891	M	M	B	185.0	110	32.14	4.18	0.46	2.09	0.45	2.06	-0.31	1.46	0.11	1.64
892	M	M	B	170.0	80	27.68	3.92	0.44	2.05	0.44	1.85	-0.1	1.7	-0.07	1.98
894	M	UM	A	160.0	64	25.00	3.44	0.2	1.97	0.24	2.06	-0.32	2.19	-0.17	2.14
895	M	UM	B	165.0	60	22.04	2.87	0.27	1.79	0.23	2.05	0.01	1.62	-0.12	1.89
896	M	UM	C	170.0	60	20.76	3.04	0.38	1.77	0.39	1.99	0.02	1.83	0.01	1.61
897	M	M	C	172.0	75	25.35	2.14	0.24	1.56	0.22	1.82	0.09	1.58	-0.01	1.86
898	M	M	B	165.0	72	26.45	1.91	0.28	1.67	0.3	1.83	0.11	1.64	0.11	1.94
899	M	M	A	165.0	84	30.85	2.41	0.39	2.03	0.33	2.12	0.18	1.57	0.03	1.6
900	F	M	B	165.0	60	22.04	3.46	0.18	1.63	0.2	1.8	-0.12	1.71	-0.36	2.19
901	F	UM	C	NA	NA	NA	2.23	0.29	2.08	0.32	1.92	0.02	2.07	0.12	2

902	M	M	B	160.0	68	26.56	3.07	0.3	1.63	0.23	1.93	-0.14	2.07	-0.04	1.7
903	M	M	B	165.0	NA	NA	2.83	0.44	1.88	0.51	1.96	0.11	1.83	0.17	2.11
904	F	UM	B	155.0	55	22.89	3.67	0.26	1.9	0.3	2.16	-0.1	1.86	-0.18	1.95
905	M	UM	C	165.0	62	22.77	3.37	0.31	1.84	0.44	2.08	-0.09	2.03	-0.08	2.13
906	F	M	B	158.0	55	22.03	3.72	0.18	1.86	0.11	1.7	-0.22	1.76	-0.29	1.62
907	M	M	B	168.0	74	26.22	2.47	0.3	2.08	0.21	1.98	0.02	2.13	-0.04	2.17
908	F	UM	B	162.0	60	22.86	2.9	0.13	1.93	0.15	1.98	-0.31	2.03	-0.09	2.08
909	F	UM	B	152.0	43	18.61	3.55	0.38	1.91	0.37	1.83	-0.14	1.91	-0.03	1.86
910	M	M	B	168.0	80	28.34	2.63	0.31	1.73	0.37	1.97	0.11	2.16	-0.01	2.15
911	F	UM	C	160.0	63	24.61	2.32	0.15	1.62	0.19	1.43	-0.09	2.11	-0.07	1.91
912	M	M	C	173.0	70	23.39	2.89	0.36	2.23	0.38	2.01	0.05	1.84	0.01	1.62
913	F	M	C	158.0	53	21.23	4.6	0.28	1.94	0.34	1.93	-0.06	1.78	-0.52	1.81
914	M	UM	C	169.0	55	19.26	2.64	0.07	1.8	0.2	2.01	-0.23	2.16	-0.09	2.09
916	M	M	B	178.0	68	21.46	2.67	0.24	2	0.38	1.89	-0.1	2.02	0.14	2.14
917	M	M	B	NA	NA	NA	3.4	0.31	2.02	0.36	1.97	-0.15	1.63	-0.02	2.01

918	M	M	B	158.0	56	22.43	2.65	0.34	1.94	0.39	2.11	0.09	1.92	0.03	1.81
919	M	M	C	165.0	70	25.71	3.63	0.36	1.76	0.49	1.87	-0.18	1.77	0.16	1.97
795	F	M	B	173.0	75	25.06	2.8	0.22	1.91	0.22	2.05	-0.03	1.84	-0.11	1.96
796	F	M	B	162.0	78	29.72	2.88	0.18	1.78	0.22	1.7	-0.08	1.89	-0.16	2.18
798	F	M	B	162.0	68	25.91	1.09	0.2	1.68	0.25	1.77	0.08	1.26	0.19	1.73
803	F	M	C	158.0	61	24.44	1.17	0.23	1.83	0.24	1.83	0.06	1.85	0.22	1.82
805	F	M	B	152.0	59	25.54	2.77	0.25	1.88	0.15	2.05	-0.1	2.1	-0.11	1.92
807	F	M	B	158.0	83	33.25	2.97	0.21	1.84	0.27	1.93	-0.14	1.95	-0.07	2.02
813	F	M	B	152.0	54	23.37	2.58	0.34	1.69	0.24	1.8	0.05	2.1	-0.08	2.12
814	F	M	B	152.0	75	32.46	2.67	0.23	1.87	0.25	2.08	-0.04	1.88	-0.07	1.98
815	F	M	B	152.0	47	20.34	3.06	0.24	1.75	0.2	2.12	-0.21	2.08	-0.04	2.15
816	F	M	B	160.0	58	22.66	3.3	0.14	1.92	0.15	1.67	-0.27	1.85	-0.29	2.05
825	F	M	B	162.0	43	16.38	3.77	0.21	1.83	0.21	1.49	-0.22	1.86	-0.29	2.15
827	F	M	B	152.0	70	30.30	1.93	0.19	1.79	0.19	2.06	0	1.58	0.03	1.79
829	F	UM	B	152.0	NA	NA	3.89	0.26	1.96	0.31	2.06	-0.31	1.93	-0.15	2.21

831	F	M	B	158.0	58	23.23	3.17	0.25	2.02	0.25	1.71	-0.2	2.1	-0.01	2.06
835	F	M	B	152.0	61	26.40	2.64	0.37	2.11	0.35	1.99	0.11	1.6	0.06	1.71
836	F	M	B	152.0	64	27.70	3.44	0.3	1.93	0.33	2.01	-0.18	1.49	0.11	1.73
837	F	M	B	165.0	62	22.77	2.32	0.27	1.96	0.28	2.09	0.16	1.7	0	1.36
838	F	M	B	152.0	58	25.10	3.65	0.18	1.89	0.25	1.72	-0.4	2.09	-0.11	2.13
841	F	M	B	162.0	75	28.58	2.91	0.32	1.7	0.35	1.89	-0.13	1.99	0.04	1.99
1136	M	UM	B	NA	NA	NA	2.44	0.44	1.79	0.44	1.91	0.2	2.13	0.16	2.04
1137	F	M	M	155.0	66	27.47	5.44	0.39	1.89	0.34	1.93	-0.57	1.89	-0.19	1.47
1138	F	M	A	160.0	50	19.53	3.09	0.16	1.91	0.08	2.11	-0.27	2.16	-0.25	2.18
1140	F	M	B	162.0	59	22.48	3.65	0.45	1.98	0.42	1.99	-0.07	1.93	0	1.7
1141	M	M	C	168.0	65	23.03	2.37	0.49	1.86	0.46	1.85	0.23	2.04	0.22	2.15
1142	M	M	B	165.0	56	20.57	3.1	0.37	1.91	0.39	1.89	-0.03	1.94	-0.01	1.72
1143	M	UM	A	158.0	55	22.03	2.12	0.36	2.11	0.39	2.01	0.09	2.04	0.26	2.06
1144	F	M	A	165.0	71	26.08	2.97	0.4	1.83	0.44	1.92	0.12	1.86	0.03	1.9
1145	M	M	C	165.0	68	24.98	2.65	0.51	2.06	0.62	2.1	0.21	1.68	0.35	1.68

1146	M	M	B	175.0	85	27.76	4.47	0.41	1.79	0.38	1.95	-0.17	1.54	-0.18	2
1147	F	UM	B	162.0	60	22.86	1.32	0.41	2.09	0.41	1.46	0.29	1.84	0.3	2.09
1148	M	UM	A	163.0	62	23.34	3.21	0.49	1.86	0.48	2.05	0.09	1.6	0.11	1.46
1149	M	M	A	175.0	55	17.96	2.46	0.37	1.97	0.3	1.95	0.11	1.76	0.03	1.79
1150	F	M	A	168.0	75	26.57	2.1	0.45	1.4	0.48	1.94	0.25	1.88	0.28	1.77
1152	F	M	A	156.0	49	20.13	0.85	0.35	1.9	0.2	1.89	0.19	2.17	0.21	2.08
1153	M	M	A	172.0	70	23.66	3.14	0.48	2.02	0.62	1.96	0.25	1.78	0.09	1.78
1154	M	M	A	170.0	64	22.15	2.91	0.38	1.98	0.37	2.08	0.1	2.12	-0.03	1.86
1156	F	M	A	NA	NA	NA	4.4	0.43	1.91	0.48	1.64	-0.25	1.91	0.03	1.58
1157	M	M	C	NA	NA	NA	4.91	0.46	1.97	0.38	2.14	-0.31	1.96	-0.29	2.08
1158	F	M	A	154.0	72	30.36	2.4	0.32	1.85	0.34	2.13	0.13	1.96	0.01	1.94
1159	F	M	B	170.0	74	25.61	2.46	0.46	2.08	0.55	1.83	0.27	2.09	0.18	1.6
1160	M	UM	A	NA	NA	NA	2.73	0.38	1.98	0.44	2.13	0.17	2.1	0	1.73
1161	F	M	A	150.0	56	24.89	2.38	0.28	2.09	0.29	1.96	0.05	2.06	0.05	1.98
1162	M	UM	B	165.0	78	28.65	3.62	0.29	1.65	0.33	1.76	-0.17	1.74	-0.08	1.8

1163	M	M	A	NA	NA	NA	3.3	0.37	1.99	0.3	2.06	0.04	1.99	-0.15	2.08
1164	M	M	B	173.0	72	24.06	2.54	0.45	2.15	0.46	1.98	0.26	2.15	0.11	1.77
1165	M	UM	B	178.0	75	23.67	2.61	0.3	1.93	0.28	1.94	0.05	2.04	-0.05	2
1168	M	M	A	175.0	75	24.49	2.03	0.65	1.98	0.57	1.94	0.41	1.98	0.41	1.88
1169	M	M	C	158.0	77	30.84	2.79	0.53	2.04	0.6	2.13	0.24	1.95	0.24	2.06
1171	M	M	A	NA	NA	NA	2.13	0.42	1.74	0.3	1.84	0.21	1.91	0.09	1.62
1172	M	M	C	168.0	90	31.89	2.83	0.37	1.93	0.27	2.21	0.03	1.73	-0.05	1.97
1173	F	M	C	173.0	57	19.05	2.17	0.38	1.84	0.33	1.92	0.2	1.79	0.06	1.87
1175	M	UM	A	183.0	84	25.08	2.58	0.37	1.97	0.41	2.1	0.13	1.9	0.09	1.81
1176	F	UM	B	NA	62	NA	2.69	0.5	1.98	0.43	2.19	0.16	1.89	0.15	2.02
1177	M	M	A	173.0	83	27.73	5.24	0.31	1.98	0.42	1.96	-0.39	2.09	-0.32	1.59
1179	F	UM	B	155.0	50	20.81	2.41	0.48	2.16	0.43	1.98	0.25	1.98	0.15	1.91
1180	M	M	B	165.0	80	29.38	3.64	0.38	2.02	0.43	2	-0.1	2.12	-0.05	1.9
1182	M	UM	C	183.0	80	23.89	5.94	0.31	1.97	0.37	2	-0.71	2.03	-0.51	1.98
1183	F	M	A	150.0	62	27.56	3.42	0.32	1.96	0.39	1.91	0.05	1.66	-0.14	1.93

1184	F	M	B	147.0	62	28.69	2.91	0.48	1.88	0.43	2.06	0.2	1.76	0.01	1.89
1185	F	M	A	150.0	70	31.11	4.06	0.52	1.67	0.51	2.01	0.15	1.11	-0.11	1.61
710	F	M	C	160.0	60	23.44	2.43	0.31	2.08	0.45	2.15	0.08	2.19	0.15	1.88
711	F	M	B	152.0	70	30.30	2.22	0.22	1.79	0.2	1.84	0	1.56	-0.01	1.76
712	M	NA	C	NA	NA	NA	2.34	0.53	2.23	0.5	1.74	0.28	1.88	0.25	1.82
713	F	M	C	147.0	48	22.21	2.53	0.09	2.12	0.17	1.96	-0.19	2.14	-0.1	2.06
714	M	M	C	152.0	NA	NA	1.87	0.31	1.97	0.25	1.98	-0.01	1.78	0.23	1.75
715	M	M	B	170.0	85	29.41	2.1	0.36	1.92	0.36	1.85	0.16	1.98	0.16	1.88
716	M	UM	B	180.0	70	21.60	2.63	0.28	1.87	0.3	2.08	-0.06	1.69	0.02	2
717	F	M	C	165.0	62	22.77	2.83	0.52	1.74	0.5	1.98	0.15	1.87	0.17	2
718	F	M	B	162.0	68	25.91	3.01	0.28	1.88	0.34	1.89	-0.05	1.83	-0.03	1.95
721	F	M	A	158.0	78	31.24	1.57	0.25	2.16	0.23	1.64	0.04	1.96	0.17	1.57
722	M	M	C	168.0	71	25.16	2.41	0.28	1.77	0.26	2.15	0.01	1.78	0.01	1.88
723	F	M	C	160.0	79	30.86	2.41	0.24	1.75	0.19	1.65	-0.01	1.89	-0.08	2.19
724	M	UM	C	178.0	74	23.36	1.98	0.41	2.1	0.37	1.85	0.22	1.75	0.18	2.06

726	F	M	B	160.0	55	21.48	2.68	0.4	1.98	0.44	2.03	0.19	1.79	0.02	1.89
727	M	M	KA	168.0	62	21.97	1.23	0.07	1.88	0.18	1.62	-0.01	1.39	0.04	1.76
728	M	NA	A	158.0	51	20.43	3.99	0.27	1.33	0.35	1.83	-0.2	1.68	-0.23	2.08
729	M	UM	C	175.0	68	22.20	2.66	0.4	2.16	0.33	1.88	0.14	2.04	-0.02	2
731	F	M	B	155.0	56	23.31	2.16	0.44	2	0.42	1.83	0.21	1.95	0.22	1.85
733	M	NA	B	168.0	82	29.05	2.18	0.2	1.68	0.32	1.79	0.04	2.07	0.01	1.87
734	F	UM	B	155.0	56	23.31	3.69	0.22	2.02	0.07	2.15	-0.35	1.92	-0.23	2.06
735	M	M	C	170.0	70	24.22	5.02	0.6	1.77	0.58	1.73	-0.29	1.78	0.03	1.83
736	F	M	B	160.0	75	29.30	2.27	0.25	1.4	0.23	2.16	0.01	1.96	0.03	1.96
737	M	NA	C	173.0	63	21.05	2.7	0.58	2.02	0.64	2.11	0.34	2.04	0.28	1.83
739	F	M	B	162.0	68	25.91	2.12	0.02	2.09	0.1	2.09	-0.24	1.91	-0.07	1.97
743	M	M	B	172.0	70	23.66	3.34	0.28	1.74	0.31	1.72	-0.11	1.59	-0.12	1.92
744	M	M	C	183.0	84	25.08	2.96	0.42	2.06	0.46	2.02	0.02	1.84	0.15	1.85
745	F	UM	C	160.0	58	22.66	5.02	0.37	2.02	0.39	1.92	-0.51	1.75	-0.09	1.86
746	M	UM	B	152.0	NA	NA	2.82	0.26	1.59	0.32	2	-0.01	1.87	-0.04	1.96

748	M	M	NA	NA	NA	NA	2.62	0.51	2	0.54	2.11	0.26	1.9	0.16	2.01
749	F	M	C	163.0	63	23.71	4.76	0.29	1.72	0.25	1.9	-0.37	1.92	-0.4	1.92
750	M	M	C	165.0	70	25.71	2.55	0.43	2	0.42	2.07	0.15	1.8	0.13	1.73
751	F	M	B	158.0	68	27.24	3.02	0.38	1.73	0.21	1.71	0.08	1.64	-0.14	1.63
753	M	M	C	162.0	70	26.67	1.93	0.27	1.81	0.26	1.63	0.09	1.91	0.06	1.7
755	M	M	NA	155.0	NA	NA	2.23	0.41	2.06	0.34	2.07	0.15	1.7	0.13	1.81
756	F	M	C	NA	NA	NA	2.5	0.42	2.02	0.23	1.86	0.05	2.01	0.07	2.06
757	F	M	A	152.0	58	25.10	2.29	0.38	1.93	0.41	1.93	0.16	1.84	0.14	2.1
758	F	M	C	170.0	82	28.37	1.39	0.27	1.84	0.3	1.78	0.12	1.83	0.19	1.97
759	F	M	A	160.0	63	24.61	2.46	0.4	2.18	0.35	2.28	0.09	1.87	0.1	1.8
762	M	M	C	165.0	67	24.61	2.99	0.31	2.05	0.31	2.03	-0.07	1.96	-0.04	2.15
764	F	M	C	162.0	80	30.48	1.49	0.04	1.89	0.12	2.11	-0.02	1.88	-0.1	2.17
765	F	M	B	152.0	50	21.64	3.43	0.28	1.76	0.25	1.96	-0.12	2.06	-0.12	2
766	M	M	C	170.0	70	24.22	3.39	0.44	2.07	0.5	1.96	0	1.87	0.09	1.81
772	F	M	B	155.0	57	23.73	2.37	0.46	1.83	0.39	1.92	0.16	1.78	0.19	1.59

773	M	M	B	167.0	65	23.31	3.45	0.24	1.82	0.24	2	-0.15	1.97	-0.24	1.98
774	F	M	B	158.0	62	24.84	2.29	0.39	1.91	0.36	1.52	0.19	1.8	0.07	1.81
776	M	M	C	168.0	NA	NA	2.42	0.08	2.19	0.17	2.06	-0.15	2.05	-0.09	1.94
778	F	NA	C	155.0	54	22.48	2.47	0.43	2.11	0.42	1.73	0.22	2.05	0.1	1.91
781	F	M	B	162.0	62	23.62	3.74	0.35	2.06	0.35	2.02	-0.1	1.79	-0.17	1.75
783	F	M	C	162.0	50	19.05	2.39	0.27	2.11	0.34	1.77	0.03	1.9	0.07	1.89
789	F	M	C	158.0	59	23.63	2.59	0.23	1.96	0.38	1.93	-0.03	1.88	0.03	1.52
1107	F	M	B	NA	NA	NA	2.82	0.6	2.17	0.65	1.98	0.24	1.91	0.35	2.15
1109	M	M	B	170.0	80	27.68	4.19	0.33	1.64	0.39	2.08	-0.36	1.98	0.01	1.87
1111	M	M	B	162.0	70	26.67	0.76	0.76	1.76	0.66	1.96	0.67	1.73	0.62	1.94
1112	M	M	B	155.0	NA	NA	4.09	0.53	1.85	0.65	2.04	-0.11	1.95	0.11	1.64
1114	F	M	A	162.0	65	24.77	2.42	0.53	1.62	0.53	1.64	0.38	1.93	0.16	2.01
1115	M	M	A	168.0	75	26.57	2.75	0.57	1.94	0.4	1.99	0.17	2.04	0.14	1.83
1116	M	M	A	170.0	98	33.91	3	0.71	1.62	0.73	1.98	0.31	1.98	0.42	1.92
1117	M	M	C	183.0	94	28.07	0.69	0.64	2.1	0.66	1.95	0.56	1.78	0.62	1.65

1118	M	M	B	NA	71	NA	2.14	0.6	2.03	0.51	1.8	0.32	1.64	0.36	2.02
1119	F	M	A	165.0	65	23.88	1.81	0.63	1.85	0.53	1.81	0.3	1.82	0.51	2.04
1120	M	M	A	170.0	70	24.22	2.51	0.65	2	0.6	2.02	0.31	1.89	0.35	1.89
1123	M	M	A	120.0	78	54.17	2.82	0.48	1.92	0.51	2.18	0.25	1.87	0.05	1.43
1124	F	M	A	165.0	70	25.71	2.28	0.42	2.04	0.49	1.7	0.25	1.96	0.19	1.72
1127	M	M	B	167.0	66	23.67	2.69	0.51	1.94	0.57	2.08	0.27	1.99	0.21	1.8
1128	M	M	C	160.0	72	28.13	2.59	0.57	2.11	0.53	2.1	0.29	1.85	0.21	1.99
1129	F	M	A	152.0	52	22.51	2.51	0.56	1.84	0.47	2	0.25	1.78	0.23	2
1130	F	UM	B	165.0	86	31.59	2.39	0.55	1.82	0.54	1.94	0.28	1.82	0.27	1.33
1131	F	M	C	155.0	76	31.63	4.55	0.38	1.92	0.38	1.87	-0.47	1.85	-0.08	2.04
1132	M	UM	C	178.0	68	21.46	2.6	0.66	1.94	0.65	2.23	0.35	1.98	0.37	1.79
1133	M	UM	B	162.0	62	23.62	5.32	0.35	1.81	0.34	1.8	-0.58	2.02	-0.45	2.02
1134	F	UM	B	160.0	53	20.70	2.85	0.44	2.19	0.54	1.87	0.17	1.62	0.16	1.72
1135	M	UM	A	152.0	65	28.13	2.35	0.46	2.01	0.43	1.92	0.12	1.94	0.28	1.81
1136	M	UM	A	170.0	85	29.41	3.15	0.64	1.79	0.75	1.96	0.39	1.59	0.32	1.97

1137	F	M	C	163.0	58	21.83	2.33	0.48	1.66	0.46	1.76	0.26	1.91	0.2	1.87
1138	M	M	B	NA	NA	NA	2.3	0.48	2.07	0.48	1.82	0.26	1.89	0.22	2
1139	M	UM	B	177.0	69	22.02	3.17	0.51	2.08	0.55	1.8	0.08	2.09	0.24	2.03
1140	M	M	A	173.0	68	22.72	4.63	0.49	1.95	0.61	1.97	-0.26	1.8	0.19	1.81
1141	M	UM	B	168.0	63	22.32	3.34	0.26	2.06	0.48	2.15	0.12	1.92	-0.23	1.87
1142	M	UM	B	175.0	63	20.57	3.15	0.75	1.98	0.69	1.89	0.38	1.74	0.29	1.9
1143	M	UM	B	165.0	63	23.14	2.75	0.57	2.09	0.45	1.79	0.18	1.92	0.17	1.42
1144	F	M	B	NA	NA	NA	3.06	0.65	1.93	0.67	1.91	0.39	2.11	0.17	1.8
1145	F	M	B	165.0	59	21.67	2.66	0.36	2.02	0.46	1.84	0.23	1.51	0.01	1.91
1146	M	UM	B	170.0	75	25.95	3.42	0.5	1.95	0.47	2.04	0.22	1.77	-0.12	2
1147	M	M	B	165.0	70	25.71	4.65	0.48	2	0.46	1.84	-0.2	1.67	-0.11	1.85
1149	F	M	C	155.0	55	22.89	4.49	0.4	2.15	0.3	2.12	-0.37	1.91	-0.05	1.43
1150	M	M	B	183.0	NA	NA	2.29	0.51	1.96	0.46	1.62	0.25	1.64	0.28	2.04
1151	M	UM	A	183.0	70	20.90	2.25	0.58	2.1	0.58	2.09	0.36	1.97	0.33	1.86
1152	M	UM	A	175.0	77	25.14	4.65	0.36	2.02	0.39	2.15	-0.38	1.81	0.03	1.62

1153	M	UM	B	168.0	51	18.07	2.79	0.26	1.84	0.24	1.81	-0.18	1.81	0.1	1.82
1155	M	M	B	157.0	64	25.96	2.48	0.53	1.6	0.6	1.82	0.3	2.02	0.24	1.95
1157	M	UM	B	162.0	44	16.77	2.3	0.35	2.06	0.35	2.06	0.09	2.05	0.13	1.93
1158	F	UM	B	165.0	53	19.47	3.42	0.48	1.87	0.53	1.64	0.07	1.98	0.1	1.56
1160	M	UM	B	185.0	90	26.30	2.38	0.57	2.14	0.52	1.79	0.3	1.57	0.32	2.02
1161	M	UM	B	165.0	50	18.37	4.45	0.43	1.87	0.58	2.06	-0.11	1.9	0.05	1.95
1163	M	UM	B	168.0	70	24.80	4.44	0.6	1.81	0.6	1.9	0.05	2	-0.09	1.73
1164	M	UM	B	173.0	55	18.38	2.28	0.48	1.7	0.41	1.87	0.25	2	0.18	1.86
1165	M	M	B	168.0	71	25.16	3.74	0.33	2.09	0.34	1.91	-0.13	1.94	-0.09	1.5
1166	M	UM	B	183.0	71	21.20	3.05	0.43	1.95	0.49	1.79	0.07	1.9	0.1	1.89
1167	M	UM	C	173.0	80	26.73	5.41	0.17	1.54	0.17	1.83	-0.89	2.06	-0.41	1.91
1170	M	UM	C	183.0	52	15.53	2.94	0.47	1.67	0.52	1.96	0.04	1.7	0.27	1.79
1171	M	UM	A	183.0	72	21.50	3.54	0.47	1.68	0.66	1.98	0.17	1.59	0.13	1.85
1172	M	UM	C	175.0	67	21.88	3.81	0.16	1.68	0.34	1.84	-0.18	2.06	-0.22	1.81
1173	M	M	B	182.0	76	22.94	2.64	0.62	1.9	0.64	1.85	0.35	1.8	0.28	2.02

1174	M	UM	C	165.0	57	20.94	2.57	0.3	1.73	0.33	1.79	0.1	2.04	0.03	1.59
1178	M	UM	B	173.0	70	23.39	3.17	0.48	1.55	0.53	2.02	0.19	1.87	0.03	2.03
1180	M	UM	C	170.0	60	20.76	3.6	0.63	1.93	0.67	2.21	0.21	1.83	0.24	1.69
1181	M	UM	B	170.0	75	25.95	1.51	0.47	1.91	0.47	1.64	0.37	1.91	0.32	1.98
1182	M	UM	B	179.0	75	23.41	1.92	0.44	1.97	0.49	1.99	0.31	1.65	0.27	1.98
1183	F	M	C	152.0	42	18.18	3.13	0.41	1.93	0.34	1.82	0	1.95	-0.05	2.02
1184	M	UM	C	162.0	60	22.86	3.16	0.53	1.94	0.4	1.98	-0.01	2.06	0.14	1.82
1185	M	M	A	168.0	45	15.94	2.64	0.52	2.18	0.58	2.06	0.36	1.94	0.18	1.96
1186	M	UM	B	168.0	62	21.97	2.3	0.2	2.07	0.38	2.01	0.03	1.76	0.05	1.85
1187	M	M	C	168.0	74	26.22	2.39	0.47	2.11	0.52	2.19	0.21	1.81	0.27	1.87
1188	M	M	B	170.0	60	20.76	2.12	0.58	1.96	0.54	1.84	0.29	2.05	0.41	2.13
1189	M	UM	B	162.0	55	20.96	5.93	0.61	2.07	0.68	1.9	-0.32	2.07	-0.27	1.92
1190	M	UM	B	165.0	50	18.37	2.07	0.33	1.64	0.41	1.63	0.1	1.92	0.27	1.87
1191	F	M	B	158.0	45	18.03	2.54	0.42	2.04	0.48	1.89	0.14	1.55	0.23	2
1192	F	M	A	162.0	55	20.96	2.73	0.37	2.06	0.45	1.9	0.01	1.56	0.21	1.79

1193	M	UM	B	165.0	48	17.63	2.26	0.43	1.84	0.4	2	0.03	1.51	0.31	1.85
1194	M	M	B	158.0	80	32.05	3.09	0.67	2	0.67	1.98	0.28	1.75	0.29	2.03
1195	M	UM	B	175.0	63	20.57	2.72	0.56	1.92	0.69	1.79	0.37	1.64	0.22	1.92
1196	F	M	B	NA	43	NA	1.95	0.34	2	0.31	1.98	0.17	1.95	0.12	1.99
1197	M	M	B	160.0	64	25.00	4.14	0.57	1.99	0.56	2.1	-0.06	1.93	0.09	1.41
1198	M	UM	A	183.0	70	20.90	3.98	0.38	1.78	0.44	1.88	0.03	1.37	-0.22	1.56
1199	M	UM	A	165.0	50	18.37	3.61	0.36	1.94	0.32	2.03	0	1.8	-0.16	1.73
1200	M	M	B	168.0	69	24.45	3.63	0.47	1.98	0.42	2	-0.15	1.79	0.12	1.94
1201	M	M	B	170.0	70	24.22	3.65	0.69	1.91	0.72	2.13	0.24	1.81	0.18	2.09
1202	F	M	B	173.0	50	16.71	4.83	0.64	1.74	0.6	2.11	-0.13	1.83	0.07	1.81
1203	F	M	A	158.0	50	20.03	3.17	0.53	1.9	0.6	2.16	0.04	1.6	0.29	1.89
1204	M	UM	B	173.0	55	18.38	3.35	0.57	2.06	0.51	1.7	0.14	1.77	0.15	1.58
1205	M	UM	B	170.0	55	19.03	4.65	0.61	1.94	0.6	2.02	-0.3	1.84	0.15	1.95
1206	M	M	B	173.0	59	19.71	7.93	0.58	1.9	0.54	1.81	-0.81	2.11	-0.78	1.87
1207	M	M	B	178.0	70	22.09	2.54	0.5	2.1	0.55	2.21	0.13	1.7	0.34	2.23

1208	M	UM	B	160.0	49	19.14	1.45	0.6	1.73	0.71	1.73	0.49	1.83	0.52	2.16
1209	M	M	C	168.0	76	26.93	6.72	0.52	1.99	0.52	1.98	-0.54	2.11	-0.83	2.11
1210	M	M	B	160.0	45	17.58	2.49	0.47	2.02	0.48	1.95	0.3	1.8	0.12	1.93
1211	M	UM	B	160.0	65	25.39	4.57	0.43	2.17	0.62	1.93	-0.19	2.03	0.04	1.79
1212	F	M	B	165.0	60	22.04	6.44	0.41	2.04	0.48	1.94	-1.39	2.21	0.19	1.7
1213	M	M	A	170.0	68	23.53	1.76	0.51	1.85	0.58	1.87	0.38	1.71	0.37	1.91
1214	M	UM	B	168.0	46	16.30	2.37	0.37	1.75	0.62	1.93	0.24	1.85	0.32	2.02
1215	M	M	A	162.0	63	24.01	2.39	0.55	2.05	0.51	1.87	0.32	2.02	0.23	2.08
1216	F	UM	B	158.0	46	18.43	2.45	0.53	2.1	0.48	2	0.39	1.82	0.1	1.8
1217	M	UM	B	168.0	56	19.84	2.52	0.44	1.94	0.42	1.79	0.2	1.8	0.08	1.62
1218	M	UM	B	163.0	56	21.08	2.74	0.61	1.91	0.62	1.88	0.15	2.02	0.47	2.11
1219	F	M	A	134.0	45	25.06	3.15	0.27	2.02	0.17	2.12	0.61	2.03	0.64	1.79
1220	F	UM	B	155.0	50	20.81	3.2	0.13	1.94	0.36	1.95	0.06	2.05	-0.28	1.81
1221	F	UM	A	155.0	38	15.82	3.01	0.63	2.07	0.65	2.17	0.25	1.82	0.26	1.89
1222	M	M	B	170.0	95	32.87	2.44	0.7	1.97	0.63	1.87	0.37	1.82	0.41	1.83

1223	M	M	B	160.0	67	26.17	3.69	0.49	1.73	0.52	1.78	-0.13	1.44	0.24	2.04
1224	M	M	C	165.0	58	21.30	2.92	0.56	2.1	0.58	2.06	0.16	1.87	0.31	2.1
1225	M	UM	C	174.0	58	19.16	2.18	0.15	2.06	0.39	2.12	0.01	1.82	0.12	1.76
1226	M	UM	B	163.0	65	24.46	2.08	0.5	1.89	0.46	1.59	0.29	1.99	0.26	1.88
262	M	M	B	178.0	96	30.30	0.88	0.57	2.09	0.64	1.98	0.48	1.89	0.55	2.16
263	M	M	C	165.0	74	27.18	2.54	0.58	1.7	0.57	2.18	0.28	2.12	0.31	1.94
265	M	M	B	165.0	67	24.61	2.78	0.25	2.21	0.32	2.19	0.09	2.05	-0.1	2.08
274	M	M	B	163.0	78	29.36	2.3	0.46	1.89	0.58	2.1	0.21	1.95	0.33	2.02
275	M	M	B	173.0	62	20.72	2.48	0.45	1.96	0.47	2.03	0.15	1.75	0.21	2.2
277	M	M	C	175.0	72	23.51	4.67	0.45	1.85	0.45	1.91	-0.28	1.87	-0.08	1.98
278	M	M	C	173.0	79	26.40	2.61	0.46	1.83	0.45	1.69	0.13	1.9	0.15	2.08
281	M	M	C	175.0	84	27.43	2.29	0.53	1.91	0.51	1.91	0.29	1.6	0.29	1.89
284	M	M	B	161.0	80	30.86	3.87	0.6	2.08	0.58	2.12	0.08	1.87	0.08	2.08
285	M	M	C	172.0	78	26.37	2.74	0.51	2.17	0.47	2.17	0.32	2.09	0.11	1.82
286	M	M	B	178.0	76	23.99	3.49	0.59	2.12	0.53	1.96	-0.08	1.81	0.24	1.8

287	M	M	B	175.0	100	32.65	1.8	0.32	1.62	0.53	1.74	0.32	2	0.2	1.99
289	M	M	B	173.0	NA	NA	4.5	0.32	1.54	0.35	1.98	-0.32	2.04	-0.1	1.68
292	M	M	B	NA	68	NA	2.97	0.52	2.02	0.54	2.1	0.1	2.08	0.18	2
299	M	M	C	183.0	68	20.31	2.72	0.38	1.79	0.43	1.99	0.1	1.91	0.12	1.73
301	M	M	B	168.0	60	21.26	3.03	0.35	1.16	0.41	1.9	0.12	1.83	-0.04	2.22
307	M	M	C	165.0	63	23.14	3.71	0.56	1.7	0.54	1.96	-0.01	1.79	0.16	1.7
308	F	M	C	NA	70	NA	3.98	0.51	2.16	0.58	2.22	-0.13	1.81	0.19	1.81
309	M	M	C	168.0	76	26.93	2.64	0.36	2.08	0.37	1.93	0.1	1.98	0.05	1.85
311	M	M	B	162.0	60	22.86	2.51	0.53	2.06	0.59	2.19	0.24	1.87	0.31	1.83
312	M	M	C	158.0	53	21.23	4.69	0.51	1.94	0.45	1.98	-0.32	1.96	0.09	1.86
317	M	M	B	166.0	66	23.95	2.76	0.5	2	0.57	1.7	0.25	1.64	0.28	2.1
318	M	M	C	171.0	72	24.62	2.81	0.5	1.82	0.42	1.7	0.09	1.7	0.16	1.79
320	M	M	C	172.0	75	25.35	2.3	0.57	2.1	0.52	1.97	0.34	1.93	0.29	2.16
321	M	M	C	178.0	95	29.98	2.56	0.77	1.85	0.74	1.97	0.5	1.96	0.45	1.98
322	M	M	M	178.0	81	25.56	2.46	0.55	1.97	0.51	1.87	0.29	1.97	0.21	1.92

324	M	M	B	174.0	77	25.43	3.07	0.51	1.96	0.55	1.74	0.27	1.98	0.09	1.65
325	M	M	B	170.0	74	25.61	2.39	0.57	1.96	0.52	2.03	0.28	2.04	0.3	1.93
328	M	M	B	155.0	63	26.22	2.43	0.75	1.75	0.62	1.68	0.46	1.7	0.47	1.73
329	M	M	B	155.0	NA	NA	2.27	0.45	1.89	0.52	1.74	0.21	1.81	0.3	1.52
330	M	M	C	178.0	76	23.99	2.45	0.43	2.09	0.45	2.09	0.11	1.56	0.22	2.08
332	M	M	C	174.0	80	26.42	4.49	0.43	2.13	0.58	2.07	-0.15	1.44	0.02	2.03
333	M	M	C	165.0	72	26.45	2.24	0.65	2.11	0.6	2.18	0.39	1.81	0.41	1.94
343	M	M	C	172.0	75	25.35	3.7	0.53	2.13	0.53	2.1	0.05	1.73	0.05	1.8
350	M	M	C	175.0	78	25.47	5.36	0.58	1.91	0.54	1.92	-0.23	1.87	-0.21	1.82
352	M	M	C	178.0	72	22.72	2.53	0.81	1.75	0.64	2.06	0.46	1.61	0.41	2.13
353	M	M	C	170.0	59	20.42	3.21	0.4	2.21	0.37	2.05	0.02	1.36	-0.01	2
356	M	M	B	174.0	75	24.77	0.26	0.3	1.93	0.34	1.65	0.27	1.81	0.32	2.14
365	M	M	C	178.0	75	23.67	3.46	0.48	1.75	0.56	2.08	0.18	1.68	0.01	1.89
371	F	M	B	145.0	60	28.54	1.45	0.34	1.44	0.24	1.83	0.24	2	0.11	1.87
372	M	M	C	160.0	72	28.13	0.77	0.51	1.93	0.48	2.06	0.43	1.84	0.44	1.95

379	F	M	C	158.0	56	22.43	2.22	0.23	1.83	0.28	2.16	0.01	2.12	0.02	1.94
380	M	M	B	188.0	77	21.79	1.11	0.3	1.75	0.26	2.03	0.4	1.95	0.34	1.98
382	M	M	C	160.0	75	29.30	3.02	0.4	1.99	0.38	1.81	0.03	1.92	0.04	1.87
384	M	M	C	175.0	70	22.86	2.05	0.52	1.93	0.49	2.07	0.32	1.59	0.3	1.89
392	M	NA	NA	160.0	73	28.52	1.87	0.15	2.17	0.23	2.12	0.06	1.91	-0.05	1.79
396	M	M	C	178.0	82	25.88	2.45	0.54	1.8	0.49	1.86	0.26	2.23	0.26	2.14
400	M	M	C	183.0	74	22.10	2.48	0.33	1.96	0.41	1.78	0.06	2.02	0.15	2.05
412	M	M	C	168.0	NA	NA	1.87	0.42	1.87	0.44	1.93	0.29	1.72	0.21	2.25
415	M	M	B	164.0	69	25.65	1.52	0.39	1.85	0.36	1.9	0.26	1.89	0.22	1.66
416	M	M	B	168.0	72	25.51	3.16	0.34	2.09	0.42	1.92	0.05	1.58	-0.07	1.92
420	M	M	B	162.0	66	25.15	2.56	0.45	2.04	0.47	1.91	0.16	1.58	0.18	1.98
426	M	M	C	165.0	65	23.88	2.28	0.72	2.09	0.67	2.15	0.43	1.53	0.47	1.77
427	M	M	B	170.0	63	21.80	4.06	0.64	1.97	0.51	2.01	0.15	1.75	0.05	1.39
431	M	M	C	166.0	77	27.94	1.23	0.47	1.77	0.52	2	0.37	1.65	0.38	1.84
436	M	M	B	173.0	78	26.06	2.31	0.52	1.54	0.56	1.89	0.36	1.82	0.22	1.83

437	M	M	C	178.0	78	24.62	3.14	0.63	1.97	0.52	1.27	0.21	1.73	0.32	2.11
439	M	M	B	175.0	80	26.12	1.07	0.54	1.62	0.55	2.01	0.45	1.91	0.46	2.01
440	M	M	B	160.0	72	28.13	3.47	0.5	2	0.61	1.63	0.06	1.79	0.26	1.87
442	M	M	B	165.0	NA	NA	1.98	0.51	1.92	0.5	1.81	0.34	1.71	0.29	1.95
1	M	UM	A	173.0	64	21.38	5.83	0.53	1.4	0.56	1.63	0.1	1.38	-0.7	2.17
2	F	M	B	165.0	52	19.10	5.92	0.44	1.7	0.49	1.79	-0.54	2	-0.41	2.12
3	M	UM	B	162.0	76	28.96	5.9	0.09	1.92	0.03	2.05	-1.23	2.09	-0.45	2.08
4	M	UM	A	178.0	85	26.83	3.87	0.48	1.98	0.51	2.02	0.03	1.72	0	1.49
6	F	M	C	154.0	64	26.99	3.19	0.31	1.62	0.3	2.14	-0.06	1.66	-0.03	1.64
7	F	UM	B	152.0	59	25.54	5.06	0.09	2.08	0.05	2.23	-0.33	2.25	-1.02	2.22
9	F	M	A	160.0	49	19.14	2.23	0.34	1.84	0.29	1.89	-0.03	1.98	0.25	1.84
10	F	UM	A	160.0	52	20.31	5.74	0.7	2.19	0.71	1.79	-0.2	1.72	-0.04	1.68
11	M	UM	B	168.0	63	22.32	2.36	0.73	1.56	0.69	2.11	0.48	1.81	0.42	1.78
12	M	UM	C	160.0	60	23.44	3.24	0.49	2.08	0.48	1.91	0.07	1.91	0.08	1.75
13	F	M	B	168.0	79	27.99	6.84	0.61	1.7	0.62	1.73	-0.6	2.02	-0.4	2.01

14	M	M	A	162.0	51.5	19.62	4.55	0.33	1.52	0.35	2.05	-0.51	1.92	0.04	2.16
15	M	M	C	168.0	77	27.28	2.86	0.42	1.79	0.48	1.96	0.03	2.19	0.16	2.08
16	M	UM	B	168.0	56	19.84	4.02	0.43	1.79	0.38	1.87	0.17	1.54	-0.28	1.91
17	M	UM	A	165.0	53	19.47	6.13	0.42	2.11	0.45	2.09	-0.4	1.64	-0.38	1.62
19	M	UM	A	175.0	67	21.88	3.33	0.55	2.08	0.53	1.9	0.21	1.9	0.07	1.86
20	M	UM	A	165.0	68	24.98	2.25	0.37	1.94	0.38	1.81	0.13	1.79	0.18	1.7
21	M	M	C	175.0	68	22.20	6.23	0.48	1.94	0.5	1.68	-0.22	1.75	-0.6	1.98
22	F	M	C	160.0	95	37.11	4.35	0.56	1.94	0.56	2.11	0.08	2.06	-0.12	1.81
23	F	UM	B	153.0	59	25.20	5.16	-0.5	2.02	-0.09	2.21	-1.27	2.25	-0.94	2.17
24	M	UM	A	155.0	60	24.97	2.22	0.34	1.87	0.4	1.63	0.17	1.86	0.11	2
25	M	UM	B	NA	61	NA	2.36	0.56	2.08	0.53	2.12	0.34	1.58	0.25	1.76
26	F	UM	B	160.0	52	20.31	6.27	0.54	1.76	0.53	1.96	-0.5	2.05	-0.19	1.58
27	F	UM	A	170.0	65	22.49	7.14	0.29	1.98	0.35	2.08	-0.78	2.18	-0.81	2.16
28	F	M	A	158.0	69	27.64	7.04	0.36	1.87	0.53	1.73	-0.95	2.08	-0.31	1.94
29	M	UM	A	168.0	NA	NA	4.11	0.54	1.8	0.52	2.02	0.23	1.9	-0.18	1.9

31	F	UM	NA	160.0	58	22.66	2.71	0.39	1.77	0.41	1.78	0.09	1.7	0.04	1.96
32	F	M	B	155.0	53	22.06	2.13	0.44	1.95	0.49	1.77	0.26	1.58	0.24	1.91
33	M	UM	B	160.0	48.4	18.91	3.15	0.21	1.86	0.25	1.96	0.01	2.1	-0.25	1.71
34	F	M	B	155.0	60	24.97	2.09	0.37	1.92	0.25	2	0.1	1.7	0.13	1.98
35	F	UM	A	158.0	40.5	16.22	3.28	0.1	1.62	0.13	2.09	-0.28	2.05	-0.26	2.19
36	F	UM	B	155.0	51	21.23	4.08	0.33	2.01	0.33	1.96	-0.3	2.12	-0.15	1.98
38	M	UM	B	162.0	62	23.62	4.35	0.48	1.74	0.56	1.79	0.05	1.79	-0.11	1.64
39	F	M	B	160.0	70	27.34	3.21	0	1.98	-0.02	2.03	-0.35	2.14	-0.38	1.98
40	F	M	B	162.0	69	26.29	2.8	0.57	1.96	0.52	2.03	0.2	1.76	0.29	1.98
41	F	M	C	158.0	58	23.23	5.46	0.48	1.88	0.41	1.85	-0.93	2.16	0.14	1.75
42	F	M	B	158.0	60	24.03	6.52	0.38	1.89	0.47	1.94	-0.58	2.04	-0.47	1.91
43	F	M	B	155.0	51	21.23	3.26	0.39	1.71	0.31	2.04	0.05	1.76	-0.18	2
44	M	UM	A	183.0	99	29.56	6.36	0.57	1.99	0.57	1.66	-0.49	2.02	-0.19	1.7
50	M	UM	B	170.0	NA	NA	2.17	0.34	1.89	0.31	1.89	0.15	1.98	0.11	1.58
51	F	UM	B	155.0	37	15.40	3.3	0.22	1.91	0.16	1.84	-0.17	2.19	-0.29	2

52	M	UM	C	165.0	63	23.14	2.23	0.41	2.01	0.45	2.08	0.15	2.04	0.23	1.95
53	F	UM	B	162.0	73	27.82	3.96	0.18	1.86	0.12	1.55	-0.24	1.99	-0.43	1.98
54	F	UM	B	160.0	64	25.00	5.04	0.44	1.98	0.52	1.93	-0.21	1.86	-0.29	1.85
55	M	M	C	172.0	176	59.49	2.66	0.71	1.92	0.72	1.8	0.37	2.04	0.44	2.1
56	M	UM	C	168.0	57	20.20	2.17	0.37	1.94	0.31	2.19	0.17	1.8	0.06	2
57	M	UM	B	160.0	56	21.88	1.84	0.26	2.05	0.3	2.01	0.08	1.86	0.14	2.04
58	F	UM	B	168.0	52	18.42	3.4	0.54	1.96	0.52	1.91	0.19	1.95	0	2.08
59	F	M	B	162.0	61	23.24	3.22	0.35	2.06	0.43	1.85	-0.04	1.99	0.15	1.79
61	M	M	C	172.0	63	21.30	3.28	0.41	1.93	0.34	1.9	0.02	1.96	-0.08	2
62	M	UM	B	173.0	80	26.73	3.55	0.54	1.91	0.47	1.89	0.11	1.64	0.04	1.4
63	M	M	C	183.0	85	25.38	0.31	-0.8	2.05	-0.59	1.82	-1.27	2.1	-0.15	1.89
64	M	UM	A	173.0	60	20.05	2.56	0.35	1.87	0.33	1.92	0.01	1.23	0.18	1.89
65	M	UM	C	173.0	69	23.05	4.54	0.55	2.06	0.56	2.02	-0.15	2.02	0.07	1.32
67	M	NA	A	173.0	59	19.71	2.66	0.54	1.87	0.51	1.96	0.17	1.93	0.22	1.58
68	M	NA	B	162.0	73	27.82	3.64	0.5	1.89	0.42	2.04	-0.09	1.72	0.1	1.82

70	F	NA	B	165.0	85	31.22	1.89	0.59	2.1	0.52	2.06	0.37	2.02	0.37	1.79
72	M	UM	A	157.0	67	27.18	2.36	0.52	1.87	0.51	1.83	0.25	1.46	0.27	2.02
75	M	NA	B	183.0	57	17.02	2.63	0.28	2.03	0.24	1.89	-0.02	2.01	-0.02	2
76	F	M	C	NA	54	NA	3.11	0.26	1.75	0.23	1.81	-0.19	1.89	0.05	1.68
78	M	M	C	170.0	71	24.57	2.2	0.49	2.17	0.4	1.99	0.26	1.92	0.16	2.02
79	M	M	B	170.0	60	20.76	3.1	0.51	2.07	0.53	2.11	0.06	1.7	0.21	2
81	M	UM	B	181.0	67	20.45	3.95	0.43	1.95	0.41	1.81	-0.09	1.78	-0.17	1.91
82	F	UM	C	153.0	53	22.64	3.62	0.47	1.98	0.42	1.93	0.03	1.41	0.1	1.46
83	F	UM	A	165.0	53	19.47	4.02	0.23	1.71	0.36	1.84	-0.14	1.77	-0.24	1.93
84	M	NA	A	165.0	59	21.67	3.03	0.38	2.08	0.34	2	-0.05	2.05	0.12	1.81
85	M	M	B	175.0	57	18.61	2.8	0.37	1.7	0.36	1.63	0	1.62	0.02	2.04
86	M	NA	A	157.0	60	24.34	2.57	0.52	1.9	0.51	1.98	0.18	1.75	0.27	1.59
87	F	UM	B	142.0	52	25.79	6.47	0.17	2	0.12	2.02	-1.05	2.18	-0.69	2
88	F	M	B	160.0	45	17.58	4	0.4	1.89	0.38	1.87	-0.27	1.95	0.09	1.62
89	F	UM	A	NA	NA	NA	3.81	0.58	2.07	0.5	2.18	0	2	0.15	1.76

90	F	UM	A	160.0	53	20.70	3.32	0.31	2.01	0.29	1.94	0.01	1.87	-0.2	1.92
91	M	UM	B	183.0	80	23.89	3.3	0.46	1.97	0.43	1.47	0.03	1.96	-0.01	2.16
92	M	M	C	167.0	58	20.80	2.31	0.57	1.98	0.58	1.94	0.33	2.05	0.34	2.15
95	M	UM	B	173.0	63	21.05	2.04	0.41	1.83	0.41	1.85	0.23	1.91	0.18	1.64
96	M	UM	B	168.0	68	24.09	3.61	0.32	1.95	0.36	2.11	-0.06	2	-0.21	2.2
97	M	UM	A	168.0	53	18.78	2.43	0.26	1.78	0.31	1.94	-0.05	1.7	0.14	1.91
98	F	UM	B	160.0	43	16.80	2.7	0.6	1.95	0.48	1.95	0.31	1.64	0.19	1.34
99	F	UM	B	160.0	53	20.70	4.87	0.14	2.02	0.27	2.03	-0.68	2.11	-0.26	1.82
100	M	UM	B	168.0	70	24.80	2.5	0.47	2.01	0.48	1.79	0.26	1.89	0.13	1.84
102	F	M	B	155.0	60	24.97	2.74	0.36	1.75	0.28	2.1	0.06	1.85	-0.01	1.83
103	F	M	B	162.0	62	23.62	2.69	0.42	1.86	0.45	2	0.13	1.66	0.1	1.77
105	F	UM	B	158.0	48	19.23	4.92	0.35	1.83	0.39	2.07	-0.28	2.19	-0.47	2.19
106	M	UM	C	160.0	65	25.39	3.22	0.45	2.06	0.53	2.12	0.07	1.94	0.11	1.78
107	M	UM	A	158.0	64	25.64	2.55	0.53	1.93	0.54	1.83	0.28	1.78	0.21	1.93
108	F	UM	B	165.0	105	38.57	4.95	0.38	2.04	0.49	2.22	-0.19	1.69	-0.3	1.94

109	F	UM	B	145.0	35	16.65	4.63	0.19	1.79	0.23	1.73	-0.44	1.92	-0.42	2.23
110	M	UM	B	170.0	62	21.45	3.36	0.47	2.06	0.47	2.17	0.13	1.91	0.02	2.12
111	M	UM	B	155.0	58	24.14	4.73	0.29	1.75	0.41	2.14	-0.21	1.83	-0.15	1.52
114	M	UM	A	162.0	72	27.43	2.59	0.43	2.07	0.37	1.86	0.18	1.77	0.05	1.92
115	M	UM	B	168.0	60	21.26	2.99	0.43	2	0.49	1.99	0.07	1.87	0.09	1.89
116	M	M	B	NA	NA	NA	2.89	0.6	1.89	0.48	1.72	0.25	2.04	0.16	1.83
119	M	UM	A	162.0	74	28.20	1.32	0.22	1.79	0.3	2.02	0.12	1.49	0.16	1.49
120	M	UM	B	168.0	56	19.84	3.17	0.52	1.55	0.48	1.96	0.07	1.4	0.14	1.96
121	F	UM	B	165.0	59	21.67	2.31	0.7	1.66	0.67	2.1	0.5	1.63	0.4	2.19
122	F	UM	B	152.0	NA	NA	1.75	0.22	1.67	0.28	1.56	0.06	1.62	0.11	1.62
123	F	UM	C	143.0	53	25.92	2.09	0.21	1.84	0.28	2.17	-0.01	1.95	0.1	2.1
124	M	UM	B	158.0	58	23.23	3.5	0.41	1.95	0.37	1.84	0.05	1.99	-0.18	1.89
125	M	UM	B	170.0	55	19.03	1.78	0.29	1.91	0.34	1.75	0.15	1.87	0.14	1.64
126	M	UM	B	169.0	55	19.26	3.31	0.17	1.86	0.28	1.7	-0.07	1.88	-0.2	1.94
127	M	UM	B	175.0	78	25.47	2.2	0.36	1.85	0.34	2.11	0.19	2.08	0.09	2

128	F	M	C	162.0	56	21.34	3.02	0.48	1.94	0.36	1.8	0.06	1.88	0.03	2
129	M	M	B	157.0	97	39.35	2.83	0.32	1.83	0.35	2.18	0.02	1.46	0	1.65
130	F	M	C	NA	55	NA	3.55	0.2	1.79	0.29	1.61	-0.26	2.01	-0.09	2.03
131	F	UM	C	166.0	50	18.14	1.56	0.16	1.83	0.28	2.01	0.08	1.83	0.07	1.94
133	F	UM	A	170.0	52	17.99	7.15	0.61	1.9	0.57	2.04	-0.42	1.95	-0.74	2.12
134	F	NA	C	155.0	46	19.15	5.64	0.43	1.97	0.41	1.89	-0.73	1.99	-0.06	1.16
135	M	M	B	168.0	57	20.20	2.33	0.56	1.97	0.5	2.04	0.3	2.18	0.25	1.76
136	F	NA	C	155.0	47	19.56	2.39	0.34	1.6	0.31	1.97	0.06	1.78	0.11	1.8
137	M	NA	B	183.0	NA	NA	2.33	0.59	2.09	0.52	2.16	0.36	2.11	0.23	1.91
138	M	M	B	168.0	54	19.13	2.28	0.26	2.03	0.31	2.23	0.02	1.94	0.12	2.02
139	M	NA	A	NA	60	NA	2.51	0.47	2.11	0.41	1.95	0.2	1.91	0.13	1.9
140	M	NA	B	170.0	52	17.99	1.44	0.46	1.9	0.54	2.06	0.33	2.06	0.4	2.1
141	M	NA	B	170.0	65	22.49	3.8	0.34	1.84	0.28	1.79	-0.21	1.93	-0.05	1.79
143	M	NA	B	152.0	NA	NA	2.86	0.69	1.99	0.7	1.84	0.3	1.59	0.42	1.99
144	M	NA	B	170.0	54	18.69	2.42	0.26	1.88	0.18	2.09	0.11	1.77	-0.15	2.06

145	F	NA	C	158.0	65	26.04	4.76	0.66	1.84	0.49	1.78	-0.16	1.83	0.08	0.93
146	M	NA	NA	188.0	58	16.41	3.79	0.36	2	0.46	1.76	-0.08	2.06	-0.07	1.81
149	M	NA	B	178.0	74	23.36	2.46	0.31	1.78	0.3	2.03	0.06	1.48	0.01	1.82
150	F	M	C	160.0	82	32.03	3.13	0.28	2.08	0.28	2.14	-0.23	2.02	0.1	1.79
151	F	NA	B	165.0	57	20.94	2.46	0.31	1.78	0.3	2.03	0.06	1.48	0.01	1.82
152	F	NA	B	158.0	60	24.03	2.86	0.55	2.07	0.53	1.94	0.33	2.08	0.07	1.53
154	M	M	A	167.0	70	25.10	2.41	0.53	2	0.53	2	0.29	2.08	0.29	2.05
155	F	NA	B	159.0	52	20.57	5.5	0.21	1.89	0.22	1.53	-0.47	2.01	-0.71	2.03
156	M	NA	A	168.0	50	17.72	3.12	0.26	1.78	0.31	1.91	-0.03	1.29	-0.06	1.68
157	F	NA	C	152.0	NA	NA	4.16	0.26	1.95	0.24	2.07	-0.25	1.73	-0.28	1.92
158	M	NA	B	170.0	74	25.61	3.32	0.52	1.91	0.42	2.18	0.13	1.9	0	1.64
159	M	NA	A	170.0	65	22.49	1.4	0.52	2.1	0.42	2.13	0.3	1.87	0.37	2.06
169	F	UM	B	158.0	43	17.22	5.03	0.1	2	0.2	1.51	-0.74	1.92	-0.29	2.04
170	F	M	C	162.0	55	20.96	1.68	0.03	2.04	0.01	1.98	-0.09	1.95	-0.17	1.46
176	M	M	B	181.0	82	25.03	1.18	0.41	2.09	0.42	2.08	0.29	2.2	0.31	2.01

177	M	UM	C	NA	NA	NA	1.8	-0.03	2.04	0.06	1.91	-0.16	1.99	-0.13	2.09
180	F	M	B	NA	NA	NA	0.91	0.08	1.87	0.16	1.7	0.03	1.87	0.06	1.87
181	F	UM	B	160.0	88	34.38	2.76	0.35	2.02	0.2	1.51	-0.05	1.38	0.01	1.97
182	M	UM	B	175.0	65	21.22	1.82	0.3	2.09	0.24	1.94	0.16	1.9	0.07	2.03
183	M	UM	C	155.0	56	23.31	2.36	0.41	2.06	0.29	2.08	0.18	1.89	0.07	1.98
186	M	M	B	170.0	62	21.45	3.61	0.29	2.14	-0.16	1.26	-0.22	1.98	-0.6	1.72
187	M	UM	B	162.0	50	19.05	3.63	0.25	1.86	0.27	2.06	-0.07	1.48	-0.29	2.02
188	F	UM	B	162.0	54	20.58	1.99	-0.12	2.19	-0.12	2.07	-0.42	1.87	-0.16	1.92
189	M	NA	NA	167.0	56	20.08	2.74	0.09	2.03	0.16	1.74	-0.02	1.91	-0.3	1.66
190	M	UM	B	170.0	66	22.84	0.8	0.25	1.96	0.08	2.08	0.01	2.07	0.17	1.92
191	F	UM	B	168.0	57.9	20.51	2.06	0.1	1.88	0.06	1.76	-0.09	2.08	-0.15	2.2
192	F	M	B	160.0	66	25.78	1.88	-0.06	1.91	0.01	1.9	-0.27	1.84	-0.13	1.79
193	F	UM	B	NA	NA	NA	4.67	0.25	1.97	0.19	1.81	-0.38	1.62	-0.36	1.86
194	M	M	C	173.0	67.5	22.55	3.91	0.47	1.78	0.39	1.91	-0.15	1.6	0.01	1.78
195	M	UM	A	169.0	42.5	14.88	2.32	0.24	1.82	0.36	1.65	-0.01	2.07	0.18	1.84

196	F	UM	A	162.0	56	21.34	2.49	0.33	2.04	0.26	2.04	-0.01	1.78	0.09	2.06
197	F	UM	B	170.0	70	24.22	2.65	0.29	1.7	0.23	1.73	0.13	2.12	-0.17	1.77
198	M	UM	B	175.0	130	42.45	1.55	0.26	1.56	0.1	1.88	0.05	1.7	0.04	1.94
199	M	UM	B	155.0	68.5	28.51	1.86	0.32	2.1	0.32	2.09	0.17	2.03	0.14	1.77
200	M	NA	C	175.0	85	27.76	2.74	0.25	1.73	0.22	1.93	0.07	1.7	-0.18	2.06
202	M	UM	B	172.0	53	17.92	4.29	0.38	1.8	0.43	1.86	-0.25	2.1	-0.1	1.95
204	M	UM	B	155.0	60	24.97	2.47	0.48	1.87	0.4	1.96	0.11	1.72	0.25	1.91
205	M	M	B	158.0	57	22.83	3.44	0.29	2.05	0.31	1.97	-0.15	1.83	-0.01	1.9
207	F	M	C	160.0	61	23.83	2.04	0.15	1.83	0.18	1.89	-0.07	1.94	0.03	1.81
208	M	UM	B	170.0	64	22.15	2.21	0.37	2.12	0.4	1.59	0.16	2.08	0.16	1.88
209	M	UM	B	168.0	60	21.26	2.81	0.38	1.85	0.38	1.76	-0.05	1.45	0.18	1.95
210	M	UM	B	170.0	59	20.42	2.22	0.32	2.11	0.28	1.95	0.11	1.83	0.07	1.81
212	M	M	A	162.0	59	22.48	3.72	0.26	1.72	0.24	1.8	-0.32	1.38	-0.12	1.54
214	F	UM	B	158.0	53	21.23	2.43	0.25	1.98	0.25	2.12	0	1.67	-0.01	1.84
216	F	UM	B	162.0	56	21.34	5.49	0.23	1.96	0.34	2.03	-0.41	1.81	-0.72	2.15

217	M	UM	C	155.0	59	24.56	2.06	0.22	1.92	0.3	1.82	0	2.06	0.12	1.72
218	M	UM	B	162.0	58	22.10	2.68	0.28	2.02	0.27	2.06	-0.01	2.06	0.01	1.83
219	M	M	B	170.0	NA	NA	2.05	0.37	1.43	0.36	1.81	0.13	1.73	0.2	2.23
222	M	M	B	162.0	60	22.86	2.62	0.35	1.98	0.28	1.68	0.04	1.69	0.02	2.06
223	F	UM	B	162.0	67	25.53	2.06	0.43	2.05	0.42	1.93	0.2	1.87	0.23	1.41
224	M	UM	B	160.0	53	20.70	3.97	0.35	1.73	0.32	1.87	-0.24	2	-0.16	2.09
228	M	UM	B	175.0	71	23.18	3.51	0.5	2.05	0.53	1.64	0.03	1.89	0.04	1.78
229	F	UM	B	155.0	54	22.48	4.49	0.29	1.77	0.28	2.04	-0.18	1.45	-0.33	2.11
231	M	UM	B	158.0	69	27.64	4.95	0.34	1.29	0.36	1.76	-0.37	1.56	-0.18	1.85
232	F	M	C	168.0	60	21.26	2.24	0.31	2.07	0.19	1.79	0.01	1.87	0.02	1.98
233	F	M	C	165.0	60	22.04	3.68	0.41	1.8	0.45	1.98	0.02	1.19	-0.17	2
234	M	UM	B	172.0	69	23.32	2.65	0.38	1.69	0.43	1.39	0.11	1.65	0.1	2.11
237	F	M	B	152.0	48	20.78	2.82	0.27	1.8	0.26	2.11	0.03	1.83	-0.14	1.62
239	F	UM	C	152.0	51	22.07	2.27	0.32	2.11	0.27	2.01	-0.01	1.94	0.13	2.07
241	M	UM	A	178.0	87	27.46	2.72	0.36	1.79	0.31	1.72	0	1.97	0.13	1.99

242	M	UM	A	155.0	58	24.14	2.13	0.34	1.89	0.41	1.9	0.1	1.9	0.23	2.07
245	M	UM	C	185.0	72	21.04	3.26	0.49	1.97	0.45	1.73	-0.03	1.87	0.13	1.62
248	F	UM	B	152.0	NA	NA	1.71	0.29	2.1	0.33	2.08	0.14	1.83	0.16	1.83
249	F	M	B	152.0	45	19.48	3.32	0.37	1.88	0.35	1.96	-0.07	1.79	-0.07	2.1
250	M	UM	B	175.0	75	24.49	4.5	0.5	1.96	0.45	1.93	-0.02	1.8	-0.15	1.74
251	F	M	C	NA	55	NA	1.95	0.46	2	0.39	2.14	0.29	2.1	0.21	2.06
252	M	UM	A	155.0	62	25.81	3.58	0.33	1.89	0.35	2.01	-0.21	1.7	0.12	2.02
253	F	UM	C	155.0	41	17.07	2.13	0.21	1.76	0.28	2.08	0.03	1.91	0.03	1.73
254	M	UM	B	175.0	88	28.73	2.46	0.33	1.99	0.27	2	0.11	1.77	-0.02	1.91
255	F	NA	B	158.0	70	28.04	2.74	0.27	1.93	0.31	2	0.05	1.96	-0.07	1.74
256	M	UM	B	160.0	51	19.92	2.15	0.27	1.9	0.27	1.57	0.12	2.03	0.02	1.49
257	M	M	C	162.0	64	24.39	2.41	0.31	2.19	0.27	1.59	0.04	1.45	0.07	1.9
258	F	UM	B	160.0	55	21.48	2.22	0.3	1.83	0.31	1.62	0.05	2	0.1	2.04
259	M	UM	C	160.0	53	20.70	2.71	0.19	1.7	0.26	1.77	-0.1	2.08	-0.02	2.19
260	M	UM	B	173.0	79	26.40	2.76	0.31	2.15	0.3	1.76	-0.11	1.9	0.14	2.07

262	M	UM	B	175.0	62	20.24	2.37	0.49	1.83	0.43	1.98	0.2	1.87	0.2	1.83
921	F	UM	NA	NA	NA	NA	0.14	-0.54	2.09	-0.35	2.22	-0.47	2.16	-0.44	2.1
922	M	UM	NA	NA	NA	NA	3.06	-0.15	2.05	-0.13	1.98	-0.44	1.88	-0.44	2.04
924	F	UM	NA	NA	NA	NA	0.31	-0.39	1.8	-0.25	1.93	-0.26	1.87	-0.38	2.18
925	M	UM	NA	NA	NA	NA	1.79	0.08	1.7	-0.65	2.08	-0.24	1.71	-0.58	1.82
926	M	UM	NA	NA	NA	NA	1.54	-0.03	1.8	-0.11	1.97	-0.06	1.65	-0.36	2.15
928	M	M	NA	NA	NA	NA	1.71	-0.28	1.68	-0.29	2	-0.2	1.81	-0.07	1.73
929	M	UM	NA	NA	NA	NA	1.33	0.09	1.85	-0.32	2.23	-0.18	1.88	0.08	1.5
930	M	UM	NA	NA	NA	NA	4.18	-0.29	1.93	-0.02	1.77	-0.44	1.93	-0.9	2
931	M	UM	NA	NA	NA	NA	0.86	0.19	2.19	0.1	1.71	0.01	1.82	0.16	1.89
932	M	UM	NA	NA	NA	NA	3.5	0.06	1.97	-0.17	1.83	-0.05	2.03	-0.87	2.07
933	M	UM	NA	NA	NA	NA	1.04	-0.38	2	-0.6	1.94	-0.64	2.08	-0.48	2.02
934	F	M	NA	NA	NA	NA	2.94	-0.06	1.41	-0.71	2.14	0.06	1.97	-0.18	1.89
935	F	UM	NA	NA	NA	NA	2.66	0.33	2.1	0.4	2.12	0.44	1.96	-0.17	2.2
937	F	UM	NA	NA	NA	NA	1.35	0.02	1.88	0.35	2.06	0.01	1.98	0.16	1.68

939	M	UM	NA	NA	NA	NA	2.22	-0.22	1.99	-0.23	1.98	0.09	1.88	-0.8	2.04
940	F	UM	NA	NA	NA	NA	2.45	-0.01	1.9	-0.14	2.03	-0.25	1.92	-0.39	2.2
941	M	M	NA	NA	NA	NA	1.36	-0.1	2.06	-0.24	2.12	-0.13	1.99	-0.45	2.05
942	M	UM	NA	NA	NA	NA	3.79	-0.22	1.95	-0.49	1.99	-0.78	1.97	-1.01	2.02
943	M	UM	NA	NA	NA	NA	0.67	0.03	2.05	-0.58	1.94	-0.08	2.13	-0.35	1.92
944	F	UM	NA	NA	NA	NA	5.7	-0.12	2.1	-0.28	1.87	-0.78	2.17	-1.36	2.13
945	M	UM	NA	NA	NA	NA	1.87	0.05	1.6	-0.39	1.91	0.08	2.16	-0.09	1.92
946	M	UM	NA	NA	NA	NA	0.82	-0.33	2.12	-0.18	2.03	0.05	2.04	-0.6	1.86
947	F	UM	NA	NA	NA	NA	2.67	-0.44	2.08	-0.26	2.12	-0.33	2.01	-0.79	1.98
948	M	UM	NA	NA	NA	NA	0.19	0.2	1.9	0.47	2.08	0.33	1.64	0.37	2.02
949	M	UM	NA	NA	NA	NA	4.1	-0.07	1.92	-0.29	2.06	-0.7	2.03	-0.75	2.21
953	M	M	NA	NA	NA	NA	3.92	0.15	1.98	-0.68	2.21	-0.21	2.1	-1.23	2.15
954	M	M	NA	NA	NA	NA	3.41	0.06	1.78	-0.26	2.18	-0.13	1.54	-0.77	1.9
955	F	UM	NA	NA	NA	NA	1.25	-0.22	2.09	-0.56	2.21	-0.22	1.64	-0.4	2.05
956	M	M	NA	NA	NA	NA	0.31	0.15	1.84	0.46	1.98	0.18	2.08	0.39	1.84

957	M	UM	NA	NA	NA	NA	0.45	0.07	1.94	-0.33	2.1	0	2.06	-0.33	1.84
958	M	UM	NA	NA	NA	NA	3.91	0	1.8	0.01	1.67	-0.56	1.77	-0.41	2.02
959	M	UM	NA	NA	NA	NA	5.44	-0.23	2.18	0.31	2.08	-0.34	2.08	-0.8	2.03
960	F	M	NA	NA	NA	NA	1.97	-0.61	2.09	-0.56	2.14	-0.73	2	-0.68	1.78
961	F	M	NA	NA	NA	NA	1.48	-0.43	2.2	0.08	1.86	0.11	1.79	-0.2	2.05
964	F	M	NA	NA	NA	NA	0.49	0.13	2.06	-0.38	2.1	0.11	2.02	-0.29	1.98
965	M	M	NA	NA	NA	NA	1.28	-0.08	2.16	-0.25	2.17	-0.06	1.88	-0.51	2.03
966	M	UM	NA	NA	NA	NA	6.17	-0.02	2	-0.29	1.96	-1.14	2.2	-1.47	2.03
967	F	M	NA	NA	NA	NA	2.13	-0.81	2.25	-0.1	1.97	-0.31	1.83	-0.91	2.11
968	M	UM	NA	NA	NA	NA	1.93	-0.03	1.7	-0.06	2.07	0.05	1.83	-0.42	1.91
969	F	M	NA	NA	NA	NA	0.23	-0.16	1.87	-0.2	1.94	-0.15	1.93	-0.24	1.98
971	M	UM	NA	NA	NA	NA	3.04	0.59	1.86	0.62	2.12	0.21	1.48	0.26	2.02
974	M	M	NA	NA	NA	NA	1.92	-0.21	1.83	-0.05	1.95	-0.09	2.04	-0.44	2.07
975	M	UM	NA	NA	NA	NA	2.33	0.39	1.83	0.49	1.7	0.22	1.59	0.19	1.88
976	M	M	NA	NA	NA	NA	2.2	0.66	1.73	0.58	1.86	0.43	2.05	0.4	1.82

977	M	M	NA	NA	NA	NA	2.46	0.6	2.02	0.57	1.7	0.32	1.88	0.29	1.81
978	F	UM	NA	NA	NA	NA	2.74	0.44	1.88	0.53	1.83	0.15	1.8	0.13	2.02
980	M	UM	NA	NA	NA	NA	2.88	0.58	1.89	0.63	1.86	0.24	1.59	0.29	1.9
981	M	UM	NA	NA	NA	NA	3.09	0.56	1.97	0.57	2	0.22	1.55	0.15	1.77
985	M	UM	NA	NA	NA	NA	1.84	0.01	1.83	-0.19	1.87	-0.09	1.81	-0.42	2.03
986	F	M	NA	NA	NA	NA	3.45	0.09	1.81	0.18	1.44	0.61	1.84	0.56	2
987	M	M	B	180.0	85	26.23	2.99	0.36	1.89	0.43	1.65	0.01	2.17	0	2.07
988	M	UM	A	159.0	59	23.34	2.14	0.47	2.18	0.56	1.94	0.34	1.95	0.3	1.78
990	M	UM	A	165.0	53	19.47	3.1	0.56	1.56	0.45	1.94	0.11	1.87	0.18	1.96
991	M	UM	B	178.0	68	21.46	2.53	0.56	2	0.64	1.72	0.25	1.92	0.34	1.94
992	M	UM	A	162.0	50	19.05	2.64	0.41	1.98	0.47	2.07	0.14	2.09	0.14	2.16
993	M	UM	B	175.0	64	20.90	1.59	0.26	1.94	0.15	1.89	0.13	2.08	-0.03	2.06
994	F	UM	B	162.0	43	16.38	2.22	0.51	1.67	0.55	1.74	0.24	1.98	0.38	2
995	M	UM	A	174.0	63	20.81	3.57	0.46	1.81	0.51	1.95	0.09	1.23	0.14	1.87
996	M	UM	B	173.0	63	21.05	2.38	0.63	1.92	0.64	2.03	0.37	1.51	0.38	1.82

997	M	UM	A	165.0	58	21.30	3.66	0.68	1.7	0.54	1.88	-0.04	2.12	0.27	1.94
999	F	UM	B	150.0	41	18.22	4.19	0.46	1.91	0.43	2.05	-0.38	1.96	0.15	1.87
1001	M	UM	NA	183.0	59	17.62	1.44	0.33	1.82	0.38	2.09	0.23	2.01	0.21	1.97
1003	F	UM	A	147.0	55	25.45	3.27	0.63	1.93	0.63	2.06	0.2	2.02	0.17	2.02
1004	M	UM	B	170.0	63	21.80	2.47	0.46	1.97	0.55	1.82	0.25	1.79	0.21	2.05
1007	M	UM	B	165.0	60	22.04	2.23	0.21	2.11	0.2	2.1	0.04	1.93	-0.02	1.05
1008	F	UM	A	155.0	45	18.73	2.02	0.18	1.75	0.22	1.84	-0.06	1.87	0.08	1.62
1010	F	UM	B	170.0	49	16.96	2.45	0.13	2.15	0.36	1.93	0.07	1.83	-0.07	1.82
1011	M	UM	A	170.0	55	19.03	2	0.5	1.57	0.55	2.14	0.34	1.65	0.33	1.88
1013	F	M	C	162.0	57	21.72	3.91	0.43	1.87	0.39	1.98	-0.11	2.03	-0.09	1.88
1014	M	UM	B	170.0	60	20.76	3.04	0.57	1.92	0.62	1.85	0.18	1.9	0.27	1.74
1015	M	UM	A	176.0	60	19.37	2.97	0.6	1.96	0.59	1.8	0.18	1.76	0.29	2.23
1016	M	UM	B	NA	61	NA	2.96	0.68	2.03	0.66	2.02	0.32	1.54	0.32	2.19
1017	M	UM	B	170.0	53	18.34	3.61	0.56	1.75	0.49	1.84	0.08	1.07	0.09	1.75
1018	F	UM	B	NA	39	NA	2.7	0.54	2.06	0.55	2.19	0.24	1.87	0.22	1.87

1020	M	UM	A	155.0	53	22.06	2.32	0.5	2.04	0.54	2.06	0.29	1.68	0.26	2.04
1021	M	UM	A	170.0	60	20.76	3.48	0.7	1.86	0.71	1.96	0.22	2.08	0.24	1.75
1022	M	NA	A	175.0	57	18.61	2.09	0.52	1.58	0.63	1.49	0.38	1.9	0.36	1.51
1023	M	UM	A	168.0	52	18.42	3.06	0.42	1.62	0.4	1.89	0.08	1.79	0	1.68
1025	M	UM	A	158.0	47	18.83	2.29	0.25	1.76	0.25	1.61	0.05	2.01	-0.04	1.91
1026	M	UM	A	174.0	62	20.48	2.02	0.52	1.91	0.57	2.02	0.37	2.03	0.33	2.19
1027	F	UM	B	160.0	51	19.92	1.93	0.35	1.57	0.3	1.59	0.13	1.43	0.16	1.62
1028	M	UM	A	176.0	55	17.76	2.39	0.47	1.87	0.46	1.9	0.21	1.77	0.23	1.6
1030	M	UM	B	155.0	63	26.22	1.9	0.57	2.14	0.44	1.88	0.31	1.7	0.33	1.97
1031	F	UM	A	168.0	72	25.51	3.07	0.37	1.81	0.42	1.79	0	1.87	0.01	1.96
1032	F	UM	A	165.0	64	23.51	3.17	0.37	2.04	0.35	2.05	-0.04	2	0.01	1.79
1033	M	UM	A	170.0	60	20.76	2.53	0.45	1.94	0.45	2.06	0.21	1.62	0.15	1.93
1034	M	UM	A	170.0	56	19.38	3.22	0.64	2.14	0.66	2.06	0.27	1.72	0.18	1.98
1035	M	UM	A	170.0	52	17.99	3.22	0.64	2.14	0.66	2.06	0.27	1.72	0.18	1.98
1036	F	UM	B	160.0	56	21.88	2.57	0.38	1.68	0.45	1.81	0.02	1.75	0.26	1.82

1037	F	UM	B	160.0	54	21.09	3.15	0.59	1.93	0.68	1.83	0.25	1.72	0.25	1.77
1038	M	UM	B	154.0	69	29.09	1.09	0.47	1.91	0.44	1.89	0.32	1.82	0.39	1.87
1039	F	UM	A	168.0	54	19.13	4.04	0.44	1.73	0.46	2.05	-0.13	1.91	-0.01	1.8
1040	F	UM	A	160.0	57	22.27	4.86	0.5	1.85	0.54	1.73	-0.02	1.77	-0.32	1.85
1041	F	UM	B	NA	NA	NA	0.62	0.22	1.95	0.18	1.82	0.25	2.04	0.25	1.97
1042	M	UM	A	169.0	48	16.81	2.53	0.47	1.93	0.57	2.22	0.18	1.57	0.26	2.05
1043	M	UM	B	155.0	55	22.89	1.38	-0.15	1.95	-0.1	2.08	-0.22	2.1	-0.26	1.91
1044	M	UM	A	165.0	65	23.88	2.69	0.52	1.73	0.48	2.07	0.33	1.8	0.11	1.63
1046	M	UM	A	152.0	57	24.67	3.16	0.51	2.02	0.52	1.73	0.16	1.77	0.05	1.49
1047	F	M	B	147.0	50	23.14	2.43	0.23	1.81	0.13	1.9	-0.11	2.1	-0.04	2.14
1048	F	UM	C	155.0	52	21.64	2.27	0.21	1.81	0.18	1.89	-0.03	1.81	0	1.98
1049	M	UM	B	160.0	50	19.53	7.16	0.3	1.8	0.22	1.82	-0.74	2.03	-1.28	1.87
1050	M	UM	B	188.0	NA	NA	2.39	0.32	2.16	0.35	1.82	0.11	1.64	0.16	1.99
1051	F	UM	C	160.0	58	22.66	3.44	0.35	1.54	0.41	1.81	-0.02	1.58	-0.06	1.72
1052	F	UM	A	157.0	46	18.66	3.17	0.57	1.91	0.58	2.06	0.14	1.98	0.18	1.73

1053	F	UM	B	172.0	53	17.92	4.69	0.45	1.87	0.53	1.72	-0.3	1.93	-0.07	1.91
1054	M	UM	B	170.0	61.5	21.28	2.32	0.49	2.15	0.33	1.9	0.19	1.53	0.13	1.88
1055	F	UM	C	NA	NA	NA	2.18	0.32	2.09	0.34	1.74	0.09	1.85	0.15	1.78
1056	F	UM	A	152.0	43	18.61	2.72	0.52	1.92	0.47	1.85	0.17	2.04	0.14	1.88
1057	M	NA	A	162.0	50	19.05	2.58	0.54	1.83	0.57	1.78	0.24	1.73	0.28	1.79
1058	M	UM	A	169.0	60	21.01	3.07	0.46	1.94	0.43	1.76	0.1	1.96	0.02	1.95
1059	M	UM	C	162.0	62	23.62	5.17	0.39	1.67	0.4	2.1	-0.36	2.01	-0.46	2.06
1060	M	NA	NA	NA	49	NA	2.66	0.48	1.65	0.5	1.8	0.2	1.76	0.17	0.86
1061	M	NA	A	162.0	57	21.72	3.89	0.5	2	0.59	2.16	0.08	1.7	0.01	1.49
1062	M	UM	B	165.0	50	18.37	2.32	0.71	2.11	0.66	1.87	0.45	2.26	0.41	2.07
1063	F	UM	B	NA	40	NA	3.7	0.59	2.18	0.51	2.16	0.13	1.82	0.03	1.78
1064	M	NA	C	160.0	56	21.88	5.72	0.41	1.85	0.42	1.91	-0.33	1.97	-0.76	2.25
1065	F	UM	A	147.0	65	30.08	2.03	0.44	2.08	0.37	1.87	0.23	2.03	0.2	1.79
1066	M	UM	NA	165.0	43	15.79	3.2	0.51	2.13	0.5	1.91	0.18	1.84	0.02	1.9
1067	F	UM	C	158.0	49	19.63	4.58	0.34	1.91	0.25	1.73	-0.19	2.07	-0.46	1.97

RAW DATA (CYCLIC MEDITATION VS SUPINE REST, n= 66)

CYCLIC MEDITATION (n=33)

ID	GR	AGE	PR	SYS	DYS	HT	WT	BMI	AC-PRE	AC-POST	LIA-PRE	LIA-POST	RIA-PRE	RIA-POST	LIE-PRE	LIE-POST	RIE-PRE	RIE-POST
S1	CM	57	74	120	84	176	95	30.67	2.42	2.33	0.24	0.24	0.26	0.27	1.75	1.51	1.89	1.75
S2	CM	58	60	114	74	168	73	25.86	3.22	2.15	-0.02	0.29	0.35	0.34	1.66	1.85	2.02	1.95
S3	CM	58	70	124	76	156	52	21.37	3.06	1.84	0.32	0.27	0.27	0.34	2.2	1.69	1.95	1.62
S4	CM	59	86	124	80	165	68	24.98	4.17	3.26	-0.09	0	-0.02	0.19	1.45	1.81	2.03	1.84
S5	CM	54	80	124	80	165	66	24.24	1.44	2.43	0.46	0.33	0.46	0.33	1.93	1.78	2.01	1.65
S6	CM	57	80	110	80	173	80	26.73	2.69	3.24	0.41	0.36	0.39	0.31	1.89	1.7	1.97	1.79
S7	CM	56	70	120	78	162	56	21.34	2.12	2.2	0.19	0.2	0.26	0.2	1.84	2.17	2.04	1.98
S8	CM	54	74	130	80	176	100	32.28	2.29	2.01	-0.01	0.1	0.13	0.07	1.9	2.11	2.04	1.99
S9	CM	56	66	138	88	170	76	26.30	2.33	3.1	0.53	0.27	0.49	0.5	1.97	1.61	1.91	2.08

S10	CM	38	72	128	80	156	68	27.94	5.14	4.7	-0.17	0.05	-0.09	0.03	2	1.65	1.81	1.62
S11	CM	52	88	128	90	177	88	28.09	2.99	3.33	0.17	0.12	0.33	0.21	1.45	2.11	1.93	1.89
S12	CM	42	78	118	78	183	68	20.31	2.64	1.32	0.11	0.34	0.13	0.19	1.87	1.83	1.73	1.57
S13	CM	39	94	117	87	165	73	26.81	2.72	0.34	0.1	0.19	0.12	0.07	1.91	1.91	1.73	1.81
S14	CM	38	63	110	74	167	60	21.51	2.14	2.13	0.36	0.38	0.37	0.37	2.14	2.14	2.1	2
S15	CM	57	66	104	70	175	75	24.49	3.03	2.46	0.12	0.09	-0.04	0.11	1.83	1.96	2.22	1.61
S16	CM	44	88	130	80	177	81	25.85	3.23	3.09	-0.07	0.05	0.15	0.04	1.7	1.9	1.98	1.94
S17	CM	46	80	130	80	172	85	28.73	2.48	2.64	0.44	0.41	0.44	0.37	1.68	1.71	2	1.8
S18	CM	49	75	110	80	172	68	22.99	1.79	1.96	0.24	0.19	0.2	0.21	2.1	1.87	2.01	2.05
S19	CM	56	88	120	80	157	48	19.47	2.86	2.89	0.19	0.28	0.17	0.09	1.96	1.88	1.85	2.02
S20	CM	49	82	130	80	177	85	27.13	2.52	2.49	0.2	0.26	0.27	0.26	1.89	1.6	1.91	1.92
S21	CM	43	76	124	80	177	90	28.73	2.52	2.16	0.39	0.41	0.35	0.48	2.28	2.08	1.9	1.86
S22	CM	47	76	124	82	183	85	25.38	3.05	2.72	0.26	0.28	0.27	0.34	1.7	2	2.21	1.89

S23	CM	56	76	120	84	166	85	30.85	2.25	2.42	0.49	0.41	0.45	0.48	1.91	1.72	1.83	2.08
S24	CM	59	76	113	81	160	74	28.91	2.66	2.11	0.12	0.24	0.2	0.24	1.89	1.92	2.08	2.15
S25	CM	55	76	136	84	182	75	22.64	3.02	0.68	0.14	0.3	0.03	0.31	1.39	1.84	1.85	2.11
S26	CM	56	60	116	86	157	76	30.83	3.88	2.74	-0.16	-0.04	-0.19	0	2	2	1.87	2.1
S27	CM	58	84	130	78	167	68	24.38	5.36	3.78	-0.22	0.31	-0.08	-0.04	1.98	1.92	1.71	1.88
S28	CM	58	96	170	96	160	68	26.56	2.77	2.42	0.34	0.36	0.4	0.54	1.84	2.16	2.18	2.02
S29	CM	56	80	130	86	167	72	25.82	1.89	1.88	0.29	0.3	0.28	0.26	1.78	2.07	2.2	2.02
S30	CM	56	76	110	80	177	73	23.30	3.12	3.05	0.31	0.21	0.03	0.25	1.79	1.37	2	1.95
S31	CM	55	76	132	84	169	66	23.11	2.59	1.37	0.12	0.26	0.13	0.36	1.88	1.99	2.02	2.17
S32	CM	55	66	130	80	163	83	31.24	2.89	2.65	0.21	0.3	0.2	0.29	1.41	1.71	1.91	1.76
S33	CM	59	70	110	70	163	82	30.86	2.83	2.56	0.11	0.23	0.27	0.26	2.02	1.98	2.26	1.83

SUPINE REST **(n=33)**

ID	GR	AGE	PR	SYS	DYS	HT	WT	BMI	AC-PRE	AC-POST	LIA-PRE	LIA-POST	LIE-PRE	LIE-POST	RIA-PRE	RIA-POST	RIE-PRE	RIE-POST
S34	SR	57	85	150	90	167	76	27.25	2.85	2.6	0.4	0.52	1.91	2	0.49	0.5	2.05	1.82
S35	SR	55	74	110	70	172	77	26.03	2.21	2.29	0.17	0.19	1.96	2.03	0.16	0.15	1.6	1.86
S36	SR	35	70	110	80	158	74	29.64	3.59	4.84	-0.1	-0.39	2.13	1.73	-0.21	-0.26	1.72	1.7
S37	SR	54	72	130	90	165	83	30.49	3.28	2.98	0.45	0.5	2	2.03	0.38	0.43	1.96	1.83
S38	SR	59	78	150	80	178	74	23.36	2.53	1.77	0.54	0.6	1.96	2	0.37	0.52	2.09	2.11
S39	SR	59	78	140	80	170	61	21.11	2.36	2.4	0.5	0.45	2.12	2.02	0.49	0.5	1.91	2.16
S40	SR	59	68	138	88	180	94	29.01	3.11	1.67	0.05	0.3	1.31	2.18	0.18	0.28	1.64	1.85
S41	SR	59	60	132	98	155	67	27.89	3.1	1.63	0.03	0.18	1.52	1.72	-0.01	0.21	1.87	1.92
S42	SR	58	68	130	86	170	80	27.68	2.11	2.08	0.65	0.54	2.07	2.12	0.49	0.58	1.98	2.17
S43	SR	58	60	120	80	168	69	24.45	1.98	1.28	0.16	0.28	1.98	1.92	0.15	0.17	2.17	1.95
S44	SR	58	72	136	90	162	84	32.01	1.99	2.58	0.17	0.09	1.56	1.45	0.27	0.14	1.97	1.71

S45	SR	47	96	130	90	168	66	23.38	2.09	2.31	0.16	0.21	1.56	1.94	0.24	0.11	1.83	1.69
S46	SR	56	84	118	80	163	64	24.09	2.26	1.73	0.23	0.25	1.98	2.1	0.21	0.34	1.7	1.86
S47	SR	59	88	136	80	170	68	23.53	2.47	2.27	0.15	0.18	1.76	2.03	0.23	0.28	1.7	1.7
S48	SR	54	76	130	90	163	64	24.09	2.49	2.05	0.19	0.29	1.93	1.9	0.2	0.28	1.76	1.65
S49	SR	56	68	138	84	172	74	25.01	2.54	2.26	0.18	0.2	1.6	1.83	0.06	0.14	1.86	1.96
S50	SR	55	120	130	80	155	72	29.97	3.07	3.09	0.26	0.29	1.62	1.9	0.23	0.19	2.1	1.91
S51	SR	56	76	138	98	167	88	31.55	1.5	2.06	0.28	0.25	2.05	1.97	0.31	0.23	1.91	1.58
S52	SR	58	74	142	82	170	84	29.07	1.99	2.26	0.26	0.18	1.82	1.85	0.22	0.21	1.89	1.62
S53	SR	56	84	110	82	155	88	36.63	2.48	1.87	0.24	0.25	2.09	1.7	0.2	0.32	2.07	1.89
S54	SR	58	74	118	88	164	68	25.28	4.53	3.27	-0.38	-0.08	1.79	1.86	-0.17	0.07	1.93	1.71
S55	SR	58	84	138	88	165	65	23.88	3.17	2.81	0.01	0.04	1.72	2.1	0.21	0.24	1.31	2.03
S56	SR	57	92	108	80	168	70	24.80	2.19	2.24	0.26	0.24	1.87	2.06	0.2	0.19	2	1.96
S57	SR	58	64	118	74	183	52	15.53	2.23	2.42	0.11	0.07	1.4	1.92	0.03	-0.02	1.72	2.11

S58	SR	56	76	116	72	178	75	23.67	2.64	2.56	0.18	0.17	1.47	1.97	0.05	0.01	1.56	1.78
S59	SR	46	78	120	80	157	57	23.12	2.58	2.26	0.3	0.37	1.7	2.06	0.33	0.38	1.87	2.2
S60	SR	51	76	110	80	175	84	27.43	4.58	2.22	0.01	0.25	1.32	1.78	-0.14	0.33	1.65	1.89
S61	SR	53	70	150	90	171	70	23.94	3.19	4.39	0.37	-0.11	1.34	1.82	0.11	0.26	1.7	2
S62	SR	58	96	140	90	167	76	27.25	1.49	1.92	0.4	0.36	1.8	1.83	0.52	0.46	1.87	1.46
S63	SR	52	76	130	80	167	84	30.12	3.07	3.32	0.26	0.24	1.79	2.25	0.14	0.09	1.83	1.73
S64	SR	60	80	130	86	155	92	38.29	2.23	1.75	0.47	0.48	1.97	2.1	0.42	0.55	1.69	1.73
S65	SR	57	66	120	90	163	77	28.98	2.83	2.85	0.22	0.06	1.96	1.89	0.18	0.33	1.72	1.79
S66	SR	58	98	112	78	180	69	21.30	1.94	2.39	0.4	0.36	2.04	1.98	0.46	0.42	1.93	1.9

RAW DATA (INTEGRATED YOGA MODULE, n=94)

DEMOGRAPHIC DATA						***WITH FILTER* (IYM, n=94)**									
ID	**AGE**	**GENDER**	**HT**	**WT**	**BMI**	**AC-PRE**	**IAL-PRE**	**IEL-PRE**	**IAR-PRE**	**IER-PRE**	**AC-POST**	**IAL-POST**	**IEL-POST**	**IAR-POST**	**IER-POST**
106	18	FEMALE	160	52	20.31	3.87	0.48	1.98	0.51	2.02	2.18	0.44	1.66	0.46	1.89
108	38	FEMALE	168	79	27.99	3.24	0.49	2.08	0.48	1.91	2.94	0.48	1.98	0.48	1.89
111	26	FEMALE	158	46	18.43	4.55	0.33	1.52	0.35	2.05	2.56	0.48	1.69	0.4	1.97
117	24	FEMALE	160	52	20.31	4.02	0.43	1.79	0.38	1.87	2.12	0.43	1.85	0.42	1.91
119	20	FEMALE	158	45	18.03	3.33	0.55	2.08	0.53	1.9	2.63	0.58	2.09	0.52	1.7
120	24	FEMALE	165	58	21.30	3.4	0.45	1.92	0.46	1.87	2.22	0.34	1.87	0.4	1.63
121	32	FEMALE	155	53	22.06	6.54	0.57	1.93	0.62	2.02	2.36	0.56	2.08	0.53	2.12
123	18	FEMALE	158	41	16.42	4.11	0.54	1.8	0.52	2.02	2.41	0.6	2.06	0.54	2.03
124	20	FEMALE	155	51	21.23	3.15	0.21	1.86	0.25	1.96	1.81	0.27	2	0.27	1.87

126	36	FEMALE	160	70	27.34	4.35	0.48	1.74	0.56	1.79	2.46	0.44	2.06	0.41	2.08
128	37	FEMALE	158	60	24.03	6.36	0.57	1.99	0.57	1.66	3.21	0.53	2.03	0.61	1.71
129	39	FEMALE	155	57	23.73	2.17	0.34	1.89	0.31	1.89	2.75	0.38	1.93	0.38	1.63
132	19	FEMALE	155	37	15.40	2.23	0.41	2.01	0.45	2.08	2.55	0.46	1.76	0.4	1.84
134	21	FEMALE	162	73	27.82	2.66	0.71	1.92	0.72	1.8	2.58	0.52	2.23	0.59	1.83
135	31	FEMALE	160	64	25.00	2.17	0.37	1.94	0.31	2.19	3.31	0.15	1.85	0.18	1.9
139	22	FEMALE	168	52	18.42	1.84	0.26	2.05	0.3	2.01	3.06	0.31	2.13	0.34	2.12
140	22	FEMALE	173	80	26.73	4.54	0.55	2.06	0.56	2.02	2.72	0.49	2.01	0.47	2
144	30	FEMALE	159	77	30.46	2.66	0.54	1.87	0.51	1.96	2.96	0.36	1.63	0.38	1.99
152	18	FEMALE	165	53	19.47	4.1	0.42	1.8	0.44	2.23	4.46	0.39	2.03	0.34	1.94
155	18	FEMALE	160	53	20.70	2.36	0.52	1.87	0.51	1.83	2.62	0.36	1.98	0.38	1.82
163	18	FEMALE	155	53	22.06	2.78	0.66	1.78	0.66	1.99	2.84	0.7	1.92	0.63	1.98
164	33	FEMALE	163	62	23.34	3.03	0.37	1.93	0.37	1.75	2.71	0.42	2.11	0.43	2.05

173	21	FEMALE	165	59	21.67	2.2	0.49	2.17	0.4	1.99	2.69	0.36	2.15	0.36	1.83
174	22	FEMALE	150	58	25.78	3.1	0.51	2.07	0.53	2.11	3.09	0.48	2.2	0.54	2.05
175	22	FEMALE	143	53	25.92	3.95	0.43	1.95	0.41	1.81	2.47	0.4	2.08	0.39	1.91
179	26	FEMALE	163	56	21.08	2.57	0.52	1.9	0.51	1.98	3.01	0.52	2.16	0.57	2.12
180	28	FEMALE	160	55	21.48	3.3	0.46	1.97	0.43	1.47	2.81	0.48	1.8	0.42	1.8
181	28	FEMALE	166	50	18.14	2.31	0.57	1.98	0.58	1.94	2.53	0.43	2.22	0.43	1.89
184	26	FEMALE	150	47	20.89	2.04	0.41	1.83	0.41	1.85	2.04	0.46	2.2	0.42	2.05
188	27	FEMALE	155	65	27.06	3.61	0.32	1.95	0.36	2.11	2.62	0.42	2	0.32	1.86
190	29	FEMALE	160	82	32.03	2.43	0.26	1.78	0.31	1.94	2.56	0.37	1.82	0.35	1.91
191	23	FEMALE	160	57	22.27	2.5	0.47	2.01	0.48	1.79	2.22	0.37	1.91	0.36	1.69
192	20	FEMALE	158	60	24.03	3.22	0.45	2.06	0.53	2.12	2.38	0.42	1.94	0.44	2.19
195	25	FEMALE	155	58	24.14	2.55	0.53	1.93	0.54	1.83	2.45	0.36	2	0.4	1.78
197	57	FEMALE	145	61	29.01	3.36	0.47	2.06	0.47	2.17	2.38	0.39	1.7	0.39	2.02

201	23	FEMALE	163	54	20.32	4.73	0.29	1.75	0.41	2.14	1.67	0.41	1.98	0.37	1.99
202	32	FEMALE	168	58	20.55	2.59	0.43	2.07	0.37	1.86	2.13	0.44	1.9	0.46	2.03
203	33	FEMALE	159	57	22.55	2.99	0.43	2	0.49	1.99	1.91	0.49	2.11	0.49	1.88
205	22	FEMALE	163	56	21.08	2.32	0.33	2	0.42	2.04	2.3	0.49	2.06	0.47	2.09
104	20	MALE	178	85	26.83	1.78	0.29	1.91	0.34	1.75	3.04	0.28	1.89	0.3	1.52
107	25	MALE	160	60	23.44	3.31	0.17	1.86	0.28	1.7	2.5	0.26	1.73	0.23	1.66
109	29	MALE	162	51	19.43	2.2	0.36	1.85	0.34	2.11	2.31	0.33	1.98	0.37	1.91
110	22	MALE	168	56	19.84	2.49	0.13	1.51	0.22	1.8	2.77	0.16	1.93	0.17	1.65
112	19	MALE	175	67	21.88	2.33	0.59	2.09	0.52	2.16	2.28	0.49	1.94	0.51	2.06
115	24	MALE	163	60	22.58	2.51	0.47	2.11	0.41	1.95	1.54	0.44	1.98	0.43	2.02
116	25	MALE	167	61	21.87	3.29	0.16	1.96	0.31	1.98	2.54	0.32	1.68	0.34	1.87
118	21	MALE	168	65	23.03	2.46	0.31	1.78	0.3	2.03	2.22	0.14	1.51	0.09	1.9
122	36	MALE	163	48	18.07	3.32	0.52	1.91	0.42	2.18	2.62	0.31	1.82	0.27	1.98

125	21	MALE	163	62	23.34	1.18	0.41	2.09	0.42	2.08	2.77	0.57	1.79	0.57	1.97
130	18	MALE	183	99	29.56	2.36	0.41	2.06	0.29	2.08	2.82	0.54	2.08	0.46	1.9
131	20	MALE	170	65	22.49	3.63	0.25	1.86	0.27	2.06	4.85	0.42	2.04	0.48	1.99
133	36	MALE	165	63	23.14	3.91	0.47	1.78	0.39	1.91	2.28	0.45	2.06	0.51	1.97
136	59	MALE	172	76	25.69	1.55	0.26	1.56	0.1	1.88	2.13	0.35	1.96	0.39	1.61
137	27	MALE	168	56	19.84	1.86	0.32	2.1	0.32	2.09	1.88	0.41	1.8	0.44	1.91
138	21	MALE	160	56	21.88	4.29	0.38	1.8	0.43	1.86	2.71	0.48	1.9	0.42	2.01
141	28	MALE	173	68	22.72	5.74	0.7	2.19	0.71	1.79	2.92	0.32	2.01	0.42	2.22
142	27	MALE	173	59	19.71	6.84	0.61	1.7	0.62	1.73	3.85	0.49	1.94	0.5	2
145	34	MALE	169	68	23.81	5.14	0.56	2.03	0.56	2.06	4.33	0.54	2.12	0.51	1.94
146	20	MALE	157	67	27.18	6.27	0.54	1.76	0.53	1.96	2.8	0.66	2.16	0.6	2.11
147	60	MALE	175	60	19.59	3.33	0.01	2.2	0.15	1.98	3.27	0.35	1.88	0.42	1.84
148	26	MALE	167	60	21.51	4.36	0.61	1.81	0.54	1.79	2.71	0.39	1.77	0.41	1.78

149	28	MALE	170	71	24.57	2.13	0.44	1.95	0.49	1.77	1.91	0.31	1.95	0.36	2.1
150	22	MALE	170	60	20.76	3.28	0.1	1.62	0.13	2.09	2.44	0.19	2	0.24	1.97
151	25	MALE	181	67	20.45	4.08	0.33	2.01	0.33	1.96	2.76	0.35	1.73	0.42	1.71
153	18	MALE	157	60	24.34	3.21	0	1.98	-0.02	2.03	2.55	0.54	1.89	0.64	2.06
156	31	MALE	183	80	23.89	6.52	0.38	1.89	0.47	1.94	2.48	0.45	2.08	0.48	1.77
157	44	MALE	167	58	20.80	3.26	0.39	1.71	0.31	2.04	2.46	0.38	2.09	0.51	1.81
158	31	MALE	173	63	21.05	3.3	0.22	1.91	0.16	1.84	2.4	0.31	2.02	0.27	1.89
159	29	MALE	168	68	24.09	3.96	0.18	1.86	0.12	1.55	3.69	0.15	1.87	0.25	1.76
160	19	MALE	168	53	18.78	5.04	0.44	1.98	0.52	1.93	2.55	0.34	1.98	0.3	2.08
162	23	MALE	168	70	24.80	3.4	0.54	1.96	0.52	1.91	2.52	0.3	1.83	0.37	2.13
165	30	MALE	160	65	25.39	3.55	0.54	1.91	0.47	1.89	2.93	0.56	2.07	0.49	1.95
166	19	MALE	158	64	25.64	2.74	0.44	1.87	0.47	1.94	2.13	0.38	1.76	0.36	2
167	28	MALE	170	62	21.45	4.02	0.23	1.71	0.36	1.84	2.63	0.43	2.11	0.55	2.12

168	19	MALE	178	58	18.31	3.32	0.31	2.01	0.29	1.94	2.62	0.46	1.92	0.52	2.12
169	22	MALE	163	72	27.10	5.2	0.39	2.05	0.32	2.14	2.77	0.4	1.88	0.41	2.2
170	27	MALE	168	60	21.26	2.69	0.42	1.86	0.45	2	2.26	0.44	2.11	0.4	2.1
171	18	MALE	168	60	21.26	2.31	0.7	1.66	0.67	2.1	3.34	0.48	1.9	0.44	1.96
176	18	MALE	170	55	19.03	1.75	0.22	1.67	0.28	1.56	2.29	0.33	1.92	0.35	2.01
177	18	MALE	169	55	19.26	2.09	0.21	1.84	0.28	2.17	1.87	0.34	2.14	0.39	2.02
178	30	MALE	175	78	25.47	3.02	0.48	1.94	0.36	1.8	2.18	0	1.98	-0.14	2.03
182	18	MALE	163	50	18.82	3.55	0.2	1.79	0.29	1.61	1.67	0.37	1.99	0.38	1.99
185	29	MALE	183	65	19.41	1.56	0.16	1.83	0.28	2.01	2.89	0.33	2.05	0.39	1.94
186	18	MALE	167	60	21.51	2.39	0.34	1.6	0.31	1.97	2.45	0.29	1.85	0.32	2.15
187	25	MALE	163	58	21.83	4.76	0.66	1.84	0.49	1.78	2.22	0.38	1.93	0.31	1.81
189	25	MALE	178	74	23.36	3.13	0.28	2.08	0.28	2.14	0.79	0.31	2	0.28	1.92
196	28	MALE	170	74	25.61	2.46	0.31	1.78	0.3	2.03	2.22	0.14	1.51	0.09	1.9

198	44	MALE	181	82	25.03	2.86	0.55	2.07	0.53	1.94	2.4	0.39	2.1	0.46	1.94
199	28	MALE	178	56	17.67	4.16	0.26	1.95	0.24	2.07	1.21	0.15	1.72	0.09	2.11
200	25	MALE	163	50	18.82	1.96	0.36	1.78	0.47	1.77	1.95	0.52	1.89	0.45	2.15
204	31	MALE	173	67	22.39	1.99	-0.12	2.19	-0.12	2.07	2.36	0.23	1.81	0.16	1.87
206	25	MALE	175	130	42.45	2.06	0.1	1.88	0.06	1.76	1.62	0.21	2.14	0.17	2.16
207	44	MALE	155	68	28.30	4.67	0.25	1.97	0.19	1.81	2.94	0.37	1.94	0.35	2.18
208	24	MALE	172	53	17.92	2.49	0.33	2.04	0.26	2.04	3.01	0.48	1.89	0.47	1.99

DEMOGRAPHIC DATA						*WITHOUT FILTER* (IYM, n=94)							
ID	**AGE**	**GENDER**	**HT**	**WT**	**BMI**	**IAL-PRE**	**IEL-PRE**	**IAR-PRE**	**IER-PRE**	**IAL-POST**	**IEL-POST**	**IAR-POST**	**IER-POST**
106	18	FEMALE	160	52	20.31	0.03	1.72	0	1.49	0.23	1.91	0.22	1.8
108	38	FEMALE	168	79	27.99	0.07	1.91	0.08	1.75	0.14	1.7	0.1	2.14
111	26	FEMALE	158	46	18.43	-0.51	1.92	0.04	2.16	0.17	1.84	0.14	1.84
117	24	FEMALE	160	52	20.31	0.17	1.54	-0.28	1.91	0.21	2.02	0.22	1.63
119	20	FEMALE	158	45	18.03	0.21	1.9	0.07	1.86	0.26	1.87	0.01	2.1
120	24	FEMALE	165	58	21.30	0.02	1.92	0	1.52	0.17	1.86	0.11	2
121	32	FEMALE	155	53	22.06	-0.42	1.95	-0.4	1.89	0.34	1.58	0.25	1.76
123	18	FEMALE	158	41	16.42	0.23	1.9	-0.18	1.9	0.28	1.7	0.33	1.8
124	20	FEMALE	155	51	21.23	0.01	2.1	-0.25	1.71	0.03	2.09	0.18	1.87
126	36	FEMALE	160	70	27.34	0.05	1.79	-0.11	1.64	0.09	1.84	0.22	1.93
128	37	FEMALE	158	60	24.03	-0.49	2.02	-0.19	1.7	0.17	1.65	0.18	2

129	39	FEMALE	155	57	23.73	0.15	1.98	0.11	1.58	0.1	1.87	0	1.68
132	19	FEMALE	155	37	15.40	0.15	2.04	0.23	1.95	0.19	1.73	0.11	1.74
134	21	FEMALE	162	73	27.82	0.37	2.04	0.44	2.1	0.32	2.02	0.18	1.54
135	31	FEMALE	160	64	25.00	0.17	1.8	0.06	2	-0.3	1.84	-0.16	2.02
139	22	FEMALE	168	52	18.42	0.08	1.86	0.14	2.04	-0.11	2.04	0.02	1.82
140	22	FEMALE	173	80	26.73	-0.15	2.02	0.07	1.32	0.13	1.77	0.22	2.11
144	30	FEMALE	159	77	30.46	0.17	1.93	0.22	1.58	0.01	1.77	0.03	2.09
152	18	FEMALE	165	53	19.47	0.1	2.16	-0.26	1.92	-0.11	1.62	-0.32	2.01
155	18	FEMALE	160	53	20.70	0.25	1.46	0.27	2.02	0.07	1.58	0.07	1.75
163	18	FEMALE	155	53	22.06	0.32	1.7	0.32	1.71	0.28	1.64	0.39	2.09
164	33	FEMALE	163	62	23.34	0.05	1.7	0.04	1.16	0.07	1.83	0.17	2.03
173	21	FEMALE	165	59	21.67	0.26	1.92	0.16	2.02	0.11	1.95	-0.02	2.23
174	22	FEMALE	150	58	25.78	0.06	1.7	0.21	2	0.13	1.73	0.17	1.54

175	22	FEMALE	143	53	25.92	-0.09	1.78	-0.17	1.91	0.13	1.92	0.12	2.05
179	26	FEMALE	163	56	21.08	0.18	1.75	0.27	1.59	0.11	1.31	0.19	2.11
180	28	FEMALE	160	55	21.48	0.03	1.96	-0.01	2.16	0.19	2.03	0.06	1.59
181	28	FEMALE	166	50	18.14	0.33	2.05	0.34	2.15	0.17	2.03	0.12	2.08
184	26	FEMALE	150	47	20.89	0.23	1.91	0.18	1.64	0.23	2.08	0.26	2.08
188	27	FEMALE	155	65	27.06	-0.06	2	-0.21	2.2	0.17	1.84	-0.01	1.92
190	29	FEMALE	160	82	32.03	-0.05	1.7	0.14	1.91	-0.02	1.63	0.18	2.02
191	23	FEMALE	160	57	22.27	0.26	1.89	0.13	1.84	0.19	1.7	0.07	1.8
192	20	FEMALE	158	60	24.03	0.07	1.94	0.11	1.78	0.19	1.95	0.19	1.83
195	25	FEMALE	155	58	24.14	0.28	1.78	0.21	1.93	0.2	1.91	0.06	1.77
197	57	FEMALE	145	61	29.01	0.13	1.91	0.02	2.12	0.12	1.62	0.12	1.93
201	23	FEMALE	163	54	20.32	-0.21	1.83	-0.15	1.52	0.24	1.83	0.23	1.95
202	32	FEMALE	168	58	20.55	0.18	1.77	0.05	1.92	0.25	1.83	0.25	1.52

203	33	FEMALE	159	57	22.55	0.07	1.87	0.09	1.89	0.31	2.11	0.3	2.19
205	22	FEMALE	163	56	21.08	0.05	1.7	0.25	2.08	0.19	1.83	0.29	2.01
104	20	MALE	178	85	26.83	0.15	1.87	0.14	1.64	-0.02	2.14	-0.13	1.87
107	25	MALE	160	60	23.44	-0.07	1.88	-0.2	1.94	0.03	1.79	-0.05	1.77
109	29	MALE	162	51	19.43	0.19	2.08	0.09	2	0.07	1.83	0.13	2.18
110	22	MALE	168	56	19.84	0.1	1.95	-0.16	1.81	-0.16	1.85	-0.1	1.98
112	19	MALE	175	67	21.88	0.36	2.11	0.23	1.91	0.27	1.98	0.24	1.98
115	24	MALE	163	60	22.58	0.2	1.91	0.13	1.9	0.29	1.69	0.29	1.89
116	25	MALE	167	61	21.87	-0.17	2.19	-0.19	2.2	-0.03	1.92	0.16	1.86
118	21	MALE	168	65	23.03	0.06	1.83	0.01	1.82	-0.01	1.83	-0.17	1.62
122	36	MALE	163	48	18.07	0.13	1.9	0	1.64	0.06	2	-0.02	1.97
125	21	MALE	163	62	23.34	0.29	2.2	0.31	2.01	0.19	1.79	0.3	1.95
130	18	MALE	183	99	29.56	0.18	1.89	0.07	1.98	0.23	1.91	0.11	1.92

131	20	MALE	170	65	22.49	-0.07	1.48	-0.29	2.02	-0.04	1.96	-0.38	1.7
133	36	MALE	165	63	23.14	-0.15	1.6	0.01	1.78	0.21	1.6	0.26	1.99
136	59	MALE	172	76	25.69	0.05	1.7	0.04	1.94	0.12	1.93	0.19	1.91
137	27	MALE	168	56	19.84	0.17	2.03	0.14	1.77	0.22	1.9	0.27	1.65
138	21	MALE	160	56	21.88	-0.25	2.1	-0.1	1.95	0.13	1.7	0.1	1.85
141	28	MALE	173	68	22.72	-0.2	1.72	-0.04	1.68	0	2.03	0.04	2.02
142	27	MALE	173	59	19.71	-0.6	2.02	-0.4	2.01	0.02	1.49	0.13	1.7
145	34	MALE	169	68	23.81	-0.17	1.64	0.04	1.18	0.21	1.57	-0.17	1.56
146	20	MALE	157	67	27.18	-0.5	2.05	-0.19	1.58	0.35	2.08	0.26	2.06
147	60	MALE	175	60	19.59	-0.4	1.83	-0.2	1.91	-0.09	1.98	0	1.97
148	26	MALE	167	60	21.51	0.03	1.99	-0.12	1.87	0.09	1.7	0.04	1.96
149	28	MALE	170	71	24.57	0.26	1.58	0.24	1.91	-0.47	1.89	-0.2	2.06
150	22	MALE	170	60	20.76	-0.28	2.05	-0.26	2.19	-0.11	1.81	0.03	1.97

151	25	MALE	181	67	20.45	-0.3	2.12	-0.15	1.98	0.09	1.87	0.04	1.93
153	18	MALE	157	60	24.34	-0.35	2.14	-0.38	1.98	0.22	1.87	0.36	1.81
156	31	MALE	183	80	23.89	-0.58	2.04	-0.47	1.91	0.27	1.89	0.16	1.8
157	44	MALE	167	58	20.80	0.05	1.76	-0.18	2	0.11	1.86	0.27	1.96
158	31	MALE	173	63	21.05	-0.17	2.19	-0.29	2	-0.01	1.92	0.06	1.92
159	29	MALE	168	68	24.09	-0.24	1.99	-0.43	1.98	-0.35	1.9	-0.2	1.98
160	19	MALE	168	53	18.78	-0.21	1.86	-0.29	1.85	0.08	1.96	-0.03	2
162	23	MALE	168	70	24.80	0.19	1.95	0	2.08	0.19	1.68	-0.06	1.76
165	30	MALE	160	65	25.39	0.11	1.64	0.04	1.4	0.12	1.79	0.2	1.53
166	19	MALE	158	64	25.64	0.04	1.83	0.21	1.77	0.14	2.03	0.19	1.69
167	28	MALE	170	62	21.45	-0.14	1.77	-0.24	1.93	0.1	2	0.25	2.02
168	19	MALE	178	58	18.31	0.01	1.87	-0.2	1.92	0.12	1.79	0.23	1.91
169	22	MALE	163	72	27.10	-0.39	2.1	-0.38	1.35	0.17	1.68	0.05	1.46

170	27	MALE	168	60	21.26	0.13	1.66	0.1	1.77	0.18	2.02	0.17	1.96
171	18	MALE	168	60	21.26	0.5	1.63	0.4	2.19	-0.13	1.7	0.19	1.93
176	18	MALE	170	55	19.03	0.06	1.62	0.11	1.62	0.12	1.88	0.11	1.89
177	18	MALE	169	55	19.26	-0.01	1.95	0.1	2.1	0.17	1.85	0.2	1.85
178	30	MALE	175	78	25.47	0.06	1.88	0.03	2	-0.18	1.91	-0.39	2.11
182	18	MALE	163	50	18.82	-0.26	2.01	-0.09	2.03	0.21	1.9	0.21	1.75
185	29	MALE	183	65	19.41	0.08	1.83	0.07	1.94	0.02	1.93	0.02	1.89
186	18	MALE	167	60	21.51	0.06	1.78	0.11	1.8	0.04	2.06	0.04	1.73
187	25	MALE	163	58	21.83	-0.16	1.83	0.08	0.93	0.11	1.86	0.14	1.91
189	25	MALE	178	74	23.36	-0.23	2.02	0.1	1.79	0.28	1.91	0.17	1.83
196	28	MALE	170	74	25.61	0.06	1.83	0.01	1.82	-0.01	1.83	-0.17	1.62
198	44	MALE	181	82	25.03	0.33	2.08	0.07	1.53	0.12	1.61	0.23	1.97
199	28	MALE	178	56	17.67	-0.25	1.73	-0.28	1.92	0.02	1.83	0	1.77

200	25	MALE	163	50	18.82	0.23	1.91	0.23	1.8	0.32	2.01	0.26	2.14
204	31	MALE	173	67	22.39	-0.42	1.87	-0.16	1.92	-0.04	1.71	0.02	1.64
206	25	MALE	175	130	42.45	-0.09	2.08	-0.15	2.2	0.06	1.83	0.02	1.71
207	44	MALE	155	68	28.30	-0.38	1.62	-0.36	1.86	0.04	1.64	-0.01	1.56
208	24	MALE	172	53	17.92	-0.01	1.78	0.09	2.06	0.11	1.72	0.11	1.91

Appendix 8)

PUBLICATIONS FROM THIS DOCTORAL WORK

1. Kushwah, K. K., Srinivasan, T. M., Nagendra, H. R., & Ilavarasu, J. V. (2015). Effect of yoga based technique on stress and health indices using electro photonic imaging technique in managers. *Journal of Ayurveda and Integrative Medicine*. In press.

2. Kushwah, K. K., Srinivasan, T. M., Nagendra, H. R., & Ilavarasu, J. V. (2016). Development of normative data of electro photonic imaging technique for healthy population in India: a normative study. *International Journal of Yoga*, *9*(1), 49-56.

3. Kushwah, K. K., Srinivasan, T. M., & Nagendra, H. R. (2015). Effect of Integrated Yoga Program on energy outcomes as a measure of preventive health care in healthy people. *Central European Journal of Sport Sciences and Medicine*. In press.