

**INFLUENCE OF YOGA ON
“QUALITY OF LIFE”
A
RANDOMIZED CONTROL STUDY**

Thesis submitted by

SUDHEER DESHPANDE

Towards the partial fulfillment of

DOCTOR OF PHILOSOPHY (YOGA)

JANUARY 2007



Submitted to

SWAMI VIVEKANANDA YOGA ANUSANDHANA SAMSTHANA

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

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INDIA

**INFLUENCE OF YOGA ON
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By

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CERTIFICATE

This is to certify that Sudheer Deshpande who has been given Ph.D. registration with effect from September 11, 2002 by the Swāmi Vivekānanda Yoga Anusandhāna Samsthāna, under the Division of Yoga - Physical Sciences has successfully completed the required 'training' in acquiring the relevant background knowledge in understanding the "Quality of Life" in normal healthy volunteers and Yoga and has completed the required 'course of research' for not less than two years to submit this thesis entitled INFLUENCE OF YOGA ON "QUALITY OF LIFE" A RANDOMIZED CONTROL STUDY as per the regulations of the University.

We also declare that the subject matter of my thesis "INFLUENCE OF YOGA ON "QUALITY OF LIFE" A RANDOMIZED CONTROL STUDY" has not previously formed the basis of the award of any degree, diploma, associate ship, fellowship or similar titles.

R. Nagarathna,

Chairperson/Guide

H.R. Nagendra

Vice Chancellor

N.V.C. Swamy

(Dean, Academic Programmes)

Examinor 1

Examinor 2

Date:

Place: Bangalore

DECLARATION

I, hereby declare that this study was conducted by me at Swāmi Vivekānanda Yoga Anusandhāna Saṁsthāna (SVYASA), Bangalore, under the guidance of R. Nagarathna, Dean of Yoga - Life Sciences and Dr. H.R. Nagendra, Vice Chancellor, Swāmi Vivekānanda Yoga Anusandhāna Saṁsthāna, Bangalore.

I also declare that the subject matter of my thesis entitled INFLUENCE OF YOGA ON "QUALITY OF LIFE" A RANDOMIZED CONTROL STUDY has not previously formed the basis of the award of any degree, diploma, associate ship, fellowship or similar titles.

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Date:01.11.2008

(Candidate)

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Finally, I thank the Divine whose wish made this work possible.

Bangalore

Dated:

SUDHEER DESHPANDE

STANDARD TRANSLITERATION CODE

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| a | = | अ | ña | = | ढ | pa | = | प |
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| i | = | इ | cha | = | छ | ba | = | ब |
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| u | = | उ | jha | = | झ | ma | = | म |
| ū | = | ऊ | ñ | = | ञ | ya | = | य |
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ga = ग dha = ध jña = ञ
gha = घ na = न

ABSTRACT

Background

Scientific and technological progress all over the globe has made mankind highly sensitive, critical and also creative. Technology has helped us reap the benefits of its use. Associated with this progress is the emergence of two basic challenges, pollution and stress. The challenge of pollution is being tackled effectively. But on the second front, in spite of extensive research all over the globe, a decreasing “Quality of Life”, increasing health hazards, social unrest, student unrest etc., which are all different expressions of stress, have shown no trend of decrease. On the contrary, over the last two decades, it is rather on the path of ascent (Nagendra & Nagarathna, 2001).

Hence, understanding what “Quality of Life” is becomes an important criterion.

Aims

The present trial was aimed to evaluate the effects of Yoga and Physical exercise on quality of life, *Guëäs* Self Esteem and promotion of positive health.

Methods

After screening 1228 persons of both sexes between the age group of 18 – 71 years, 226 subjects consented to participate in the project. Finally data was available on 184 subjects for analysis. They were randomized into two groups, Yoga (Y) and physical exercise (PE). Assessments of the two groups were made at baseline and after 8 weeks. The Y group practised integrated yoga module. The techniques included physical practices (*Kriyas, asanas*, healthy yoga diet), breathing practices with body movements and *Pranayama*, meditation, devotional sessions, lectures on yoga, stress management and lifestyle change through notional corrections for blissful

awareness under all circumstances (action in relaxation). The PE group practiced mild to moderate physical exercises. Both groups practiced for sixty minutes a day, six days a week for 8 weeks.

Assessments

The Quality of life (QoL) was assessed by using following six questionnaires.

WHO QoL – 100 – This questionnaire has acceptable psychometric properties with good internal consistency with Cronbach's alpha ranging from 0.65 (for physical environment) to 0.93 (for working capacity). This questionnaire contains six broad domains of QoL namely Physical health (PHY), Psychological health (PSY), Level of Independence (LOI), Social relations (SRD), Environmental (ENVD) and Spiritual health (SD). Each domain contains 24 facets of 4 items each. One additional facet (4 items) pertains to Global Health (GH).

The Vedic Personality Inventory (VPI): – The VPI developed by Wolf DB in the year 1998 is a “psychological construct” to assess the three Gunas namely *Sattva*, *Rajas* and *Tamas* and has acceptable psychometric properties. It has 90 items comprising 30 for *sattva guna*, 28 for *rajoguna* and 32 for *tamo guna*. It has good internal consistency and reliability with Cronbach's alpha ranging from 0.850 for *Sattva* 0.915 for *Rajas* and 0.699 for *Tamas*.

“The ‘G’-Inventory of Personality” (GIN) – The GIN inventory is a measure of the three Gunas contains 10 questions that have 3 response choices. This test has a test-retest of 0.60 with a confidence level of 99% and has been validated.

Self Esteem Questionnaire (SEQ) - This multidimensional questionnaire developed and standardized by S.K. Karunanidhi (1996) has acceptable psychometric properties with good internal consistency, reliability and validity.

The Verbal Aggressiveness Scale (VAS) – The VAS was developed by Infante DA, Wigley CJ. This Scale is stable across time. The reported test-retest reliability is 0.82 for a 4-week period. Further the cross-culture reliability has been supported in a number of studies.

The Satisfaction with Life Scale (SWLS) - The SWLS is a short, 5-item instrument designed to measure the global judgment of life satisfaction. The SWLS has shown strong internal reliability

and moderate temporal stability. Diener et al (1985) reported a coefficient alpha of 0.87 for the scale and a 2-month test-retest stability coefficient alpha of 0.82. The scale usually requires only about one minute of respondent time.

Results

WHO QoL - 100

A comparison between the baseline values in the present study with normative values in different states of India and with other countries showed that the group in the present study had marginally higher baseline values on all domains.

The baseline values were not normally distributed. The differences between the baseline values were statistically significant. Yoga group had higher effect size in Global health and Spiritual domain (0.38) and PE group had higher effect size in physical (0.22), Psychological (0.52), Level of Independence (0.32), Social relations (0.23), environmental domain (0.47) and Global health. All domains in Yoga group showed significant changes except PHY and LOI. All domains in control group also showed significant changes except PHY. There was no significant difference between the groups.

The Vedic Personality Inventory (VPI)

The baseline values were normally distributed for *Tamas*, *Sattva*. The differences between the baseline values were not statistically significant.

Sattva- scores have increased significantly in both Y (4.88 to 5.26) ($p=0.001$) and PE (4.91 to 5.21) ($p<0.001$, Paired samples test).

Rajas – The PE group showed significant decrease in scores from 3.67 to 3.43 ($p=0.002$). Seniors have shown significant decrease in both Y (3.81 to 3.51) ($p=0.002$),

Tamas – The PE group showed a significant decrease in the *Tamas* score from 3.24 to 2.99 ($p=0.001$, independent samples t test).

“The ‘G’ – Inventory of Personality”- The GIN gives a single overall score that describes the disposition of an individual towards *Sattva*, *Rajas* or *Tamas*. The question of interest was whether an individual's *guna* type changes after intervention. To ascertain this, three different McNemar's tests were done by checking the change from presence of a *guna* to its absence, to ascertain the significance of shifts of the number of subjects who were predominantly of non-*Sattva* type before

intervention, to *Sattva* type after intervention. The same was done for non-*Rajas* to *Rajas* and non-*Tamas* to *Tamas* types.

In the Yoga group, significant number of subjects shifted from non-*Sattva* to *Sattva* type after the intervention.

Self Esteem Questionnaire (SEQ)

Competency (COM) - The PE group (43.44 to 45.23) ($p=0.033$) and juniors in PE group (42.34 to 45.07) ($p=0.035$) showed a significant increase.

Global Self-esteem (GSE) – The Y group (46.68 to 49.47) ($p=0.036$) showed a significant increase.

Moral and Self-esteem (MSE) – Significant changes occurred in Y (34.78 to 37.31) ($p=0.003$), seniors (34.31 to 39.39) ($p=0.004$) and females (33.59 to 37.77) ($p=0.001$).

Social esteem (SSE) – Significant changes occurred in seniors (31.39 to 33.92) ($p=0.023$) and females (31.28 to 33.41) ($p=0.006$) in Y group.

Family Self-esteem (FSE) – A significant increase was noticed in seniors (34.83 to 38.11) ($p=0.002$) and females (35.15 to 37.36) ($p=0.003$) in Y group.

Body and physical appearance (BPA) – A significant improvement is noticed in Y group (24.56 to 26.23) ($p=0.003$). In the PE group, juniors (25.93 to 26.59) ($p=0.002$) and males (26.37 to 25.90) ($p=0.047$) have shown a significant increase.

The Verbal Aggressive Scale has shown the changes after the intervention in the two groups. The scores on VAS in Y group (59.77 ± 7.51 to 57.36 ± 6.20) showed a significant decrease ($p=0.017$). There was a non-significant increase in PE group (58.71 ± 9.25 to 59.93 ± 8.63). There was a significant difference between groups ($p=0.013$) on ANCOVA considering the pre values as a covariate.

Satisfaction with Life Scale has shown that satisfied and extremely satisfied subjects have increased in both Y & PE groups whereas dissatisfied and neutral subjects have decreased considerably after intervention.

Conclusions

1. Quality of Life improved after both yoga and PE. Higher effect size after yoga in Spiritual health and Social relations and after PE in Physical health, Psychological health, Level of Independence, Social relations, Global health and Environmental domains.
2. Yoga increased *Sattva* reduced *Tamas*. PE group reduced *Rajas*. There was a significant difference between the groups in *Rajas*.
3. Yoga helped in shifting from non *Sattva* to *Sattva* and *Tamas* to Non *Tamas*.

4. Yoga improved Global, Moral and Body and physical appearance. PE improved Competency.
5. There was a significant decrease in verbal aggressiveness in Y group with a non-significant increase in the PE group.
6. Satisfaction with Life increased whereas dissatisfaction decreased after both Y & PE. The effect size was higher in PE

Limitations of the study

A third group without any intervention would have thrown more light on the special dimensions of yoga. A larger study with greater number of subjects would have brought out the influence of yoga on different category of people as also of gender effectively. Only psychological parameters were studied and some quantitative measures of physiological measures, as for example on brain signals (EEG studies) would have thrown more light on the relative influences of Y in comparison to PE at physiological levels also.

Suggestions for future

The duration of the interventions to be increased to six to twelve months for better results. It would be desirable to evaluate the benefits of the interventions in a single place rather than evaluating in different places.

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1. INTRODUCTION

The well-being or “Quality of Life” of a population is an important concern in [economics](#) and [political science](#). It is measured by many social and economic factors. A large part is the [standard of living](#), the amount of money and access to goods and services that a person has;

these numbers are fairly easily measured. Others like [freedom](#), [happiness](#), [art](#), [environmental health](#), and [innovation](#) are far harder to measure. This has created an inevitable imbalance as programs and policies are created to fit the easily available economic measures ignoring the others that are very difficult to assess.

Debate on “Quality of Life” is millennia-old, with [Aristotle](#) (384 – 322 BC) giving it much thought in his '[Nicomachean Ethics](#)' and eventually settling on the notion of [eudaimonia](#), a [Greek term](#) often [translated](#) as [happiness](#), as central. The neologism **liveability** (or **livability**), from the adjective *liv(e)able*, is an abstract noun now often applied to the built environment or a town or city, meaning its contribution to the “Quality of Life” of inhabitants.

Scientific and technological progress all over the globe has made man highly sensitive, critical and also creative. Sharp to the core, the intellect has gained tremendous power of analysis. The left side of the brain has highly developed, helping man to unravel the subtle mysteries of nature and understand clearly the general laws of nature. Technology has helped man to reap the benefits of its use. Associated with this growth is the emergence of two basic challenges i.e. pollution and stress. The challenge of pollution is being tackled effectively through imposing controls by the administration. But on the second front, in spite of extensive research all over the globe, the decreasing “Quality of Life” due to increasing stress born health hazards, social unrest, crimes, addictive behaviours etc., has shown no trend of decline. On the contrary, over the last two decades, these problems are all on the path of ascent (Nagendra & Nagarathna, 2001). Hence, an in depth study of the measures and techniques of “Quality of Life” has become a need of the hour.

1.1 Definition of “QUALITY OF LIFE”

In recent years, “Quality of Life” (QoL) has become a key concept in the medical community where healthcare places dual emphasis on the quality of care, in a technical sense, and client’s

QoL. Conjoining these two perspectives is a task for which the concept of QoL is especially well-suited because it comprises both objective and subjective aspects: the personal, subjective experience of one's own life, as well as the more objective assessment of external factors that influence its quality (Bell, 2000, Janke et al, Yoneda et al, Berger, Gerharz et al, Vaudre et al, Masthoff et al, Long 3rd et al, Rustoen et al 2005, Ventegodtl, Hilden, Merrick, 2003). "Quality Of Life" (QoL) is a multi-dimensional concept involving physical, individual and social dimensions (Cohen, 1989). Unlike the biomedical model, the concept of holistic health takes a much broader view of what constitutes health and the responsibility of using methods to restore the individual's health (Narayana Reddy, 2000) at all these levels.

1.1.1 – According to World Health Organisation (WHO)

WHO defines QoL (QoL) as an individual's perception of his/her position in life in the context of culture and value system in which they live and in relation to their goals, expectations, standards and concerns.

1.1.2 – According to other sources

The widely accepted definition is - "QoL is an individual's perception of well-being that stems from satisfaction or dissatisfaction with dimensions of life that are important to the individual" (Ferris, 1985) and in terms of health it is - "a pragmatic, day-to-day, functional representation of a patient's physical, psychological, and social responses to a disease and its treatment" (Schipper, 1990). Although difficult to quantify and define (Jakobovits L, 1989), it can be experienced starting from the interaction with the external world to that with the internal world (Modi. JJ, 1998). Clinicians have accepted that while survival and disease-free survival are critical factors, overall "Quality of Life" is a mere fundamental requirement (Bottomley_A, 2002).

George A. O. Alleyne in his address in a Seminar on Health and the “Quality of Life” says: “In general terms, the characteristics could be roughly divided into the internal and external factors. There are many excellent descriptions of physical and social environment the kind that I consider among the external factors that contribute to good “Quality of Life”. Conversely, there are factors that relate very much to the individual’s inner self. It is possible to imagine that there are some five main domains of QoL. Health & Wellness, Interpersonal relationships, Community & Home presence, Personal growth and dignity and Self-esteem. It is perhaps intuitively obvious that health and life are inseparable and therefore, that matters of health must enter into any conceptualization of QoL” (Alleyne , 2001) .

1.1.3 According to Scriptures

According to Indian scriptures, The “Quality of life” is said to improve as man progresses from an animal like existence based on instincts to a human existence based on intelligence (Nagendra, 2000). As man evolves the achievement of full perfection of the self or liberation from bondage merging ultimately with the Divine is the destination and the degree to which this is achieved is the “Quality Of Life” (Gundappa, 1998).

The features of QoL rooted in the deep structure of Indian culture and society based on research on Vedanta, Buddhism, Yoga philosophy and Puranic literature are the injunctions of moral living such as, (a) the individual must be respected. (b) co-operation & trust, (c) non-jealousy, (d) *cittaśuddhi* or purification of mind. (e) top quality product service, (f) work is worship, (g) containment of greed, (h) ethico-moral soundness, (i) self-discipline and self-

restraint, (j) creativity. (k) the inspiration to give, and (l) renunciation and detachment (Chakraborty, 1992).

1.2 - Concept of *Guṇas*

Vedic literature contains knowledge about all fields of human endeavor, from physics, politics and psychology to medicine, art and aeronautics. Thus research into the section of Vedas that deals with empirical knowledge opens up a large storehouse of documented revelations of sages in many areas. It says that the empirical reality that we perceive around us is composed of matter. Even the psychophysical disposition of human being is a manifestation of the three *Guṇas* (Prabhupada, 1976). Whether we are referring to the material world be it the buildings we reside in, the many possessions we strive for or our physical bodies, all objects are composed of a prime non-material energy, which may be termed 'universal consciousnesses'. This prime universal unmanifest consciousness manifests by gaining some properties or 'modes of nature' called *Guṇas*. All material elements are infused with three modes of nature, or three *Guṇas* – *Sattva*, *Rajas* and *Tamas*. All natural things, including mind, are combinations of these three *Guṇas* in different proportions and the proportion determines the degree of subtlety of the thing involved. (Bowes P, 1981). *Sattva*, the subtlest of the three, is the thought-stuff (or intelligence); *Rajas* is energy and *Tamas* is mass or inertia. While *Rajas* and *Tamas* predominate in gross matter, *Sattva* is predominant in psychical activities. These *Guṇas* combine in various proportions to produce the variety of objects and thoughts in the universe (Rao PVK, 1995). Mind is the subtlest of this combination that is in dynamic equilibrium when it is in its healthy state of functioning. At the psychological level *Sattva* is gentle and controlled, *Rajas* violent and uncontrolled, and *Tamas* is dull and uncontrolled. *Sattva Guṇa* is characterized by qualities such as cleanliness, truthfulness, gravity, dutifulness, detachment, discipline mental equilibrium, respect for superiors, sharp intelligence, sense control, and staunch determination. Attributes of

Rajas Guṇa include intense activity, desire for sense gratification, little interest in spiritual elevation, dissatisfaction with one's position, envy of others, and a materialistic mentality. Qualities associated with *Tamas Guṇa* include mental imbalance, anger, arrogance, depression, laziness, procrastination and a feeling of helplessness (Wolf DB, 1998). In an ideal situation of perfect health, man has the complete freedom to use any of these three patterns of psychological responses. Ill health or limited health occurs if *Rajas* or *Tamas* become dominant as one loses the freedom and gets habituated to either of these response patterns.

Vedas also mention that the goal of yoga practices is to reach a state of 'self-realization' by removing the coverings of the core being by these *Guṇas* through the process of *cittaśuddhi* (cleansing the impurities of the mind). This state of self-realization (perfect QoL) is characterized by an experiential knowledge about one's true nature of existence and provides access to the inbuilt unlimited potential to achieve perfect harmony with nature. As the person moves on with the any spiritual or Yoga practices, the quality of *Sattva* increases and QoL goes on improving.

1.3 – Self-Esteem

The most broad and frequently cited definition of self-esteem in psychology is "favorable or unfavorable attitude towards oneself" (Rosenberg's, 1965). "Coopersmith defines it as "a personal judgment of worthiness that is expressed in the attitudes that individual holds towards himself" (Coopersmith, 1967). Self-esteem is generally considered the evaluative component of the self-concept, a broader representation of the self that includes cognitive and behavioral aspects as well as evaluative or affective ones (Blascovich, Tomaka, 1991). Generally it is understood that self-esteem is appreciation of worth and estimate of value.

1.4- Concept of Health

1.4.1 - According to World Health Organisation

The World Health Organization (WHO) defines “Health” as a dynamic state of complete physical, mental, spiritual and social well-being and not merely the absence of disease or infirmity (WHO, 1998).

1.5 - Physical activity – its importance

Physical activity is a powerful weapon for individuals interested in health maintenance. Many benefits of physical and psychological of regular physical activity are well known to the medical community including improved weight control, healthier cardiovascular system, and tighter diabetic control. Less recognized benefits of physical activity may include stronger bones, better sleep, lower blood pressure, improved mood, opportunities for personal enjoyment, cancer prevention, and even a longer lifespan (Fuscaldo, 2002). Research studies over the past several decades confirm the health benefits of regular physical activity, a concept with foundations in antiquity. Although details remain to be clarified, it is now clear that regular physical activity reduces the risk of morbidity and mortality from several chronic diseases and increases physical fitness, which leads to improved function. An important point is that it does not matter what type of physical activity is performed: Sports, planned exercise, household or yard work, or occupational tasks are all beneficial. The key factor is total energy expenditure; if that is constant, improvements in fitness and health will be comparable (Blair, Kohl, Gordon, 1992). A sedentary lifestyle is prevalent in most industrialized societies. Persuasive evidence shows a physically active lifestyle protects against the development and progression of many chronic diseases (King, Senn, 1996). Starting patients on an exercise program can accomplish more than many other efforts a physician undertakes. Regular physical activity has been consistently related to improvements in health-related quality of life (HRQL) in older adults. Nevertheless, systematic investigations of the influence of exercise therapy on older men and

women enrolled in cardiac rehabilitation remain sparse (Focht, Brawley, Rejeski, Ambrosius, 2004). In recent years more attention has been paid to the psychological effects of exercise, and much evidence can be found in the literature to support these beneficial effects. Psychologically, exercise has also been shown to elevate mood, increase intellectual functioning, and improve self-concept (Anthony, 1991).

The theme of the proposal presented by World Health Organization (WHO) in 2002 and modified in 2004 said that appropriate regular daily physical activity is a major component in preventing chronic diseases, along with non-smoking and a healthy diet. For individuals, it is a powerful means of preventing chronic diseases; with a wide range of physical, social and mental health benefits. For nations, it can provide a cost-effective way of improving public health across the population. Physical activity interacted positively with strategies to improve diet, discourage the use of tobacco, alcohol and drugs, helped to reduce violence, enhanced functional capacity and promoted social interaction and integration in normal adults. Following the successful World Health Day 2002, Member States agreed to celebrate "Move for Health" Day annually to promote physical activity as essential for health and well-being and further linked to a larger ongoing process to promote physical activity worldwide throughout the year amongst men and women of all ages and conditions, in all domains (leisure, transport, work) and settings (school, community, home and workplace) (WHO, 2002).

1.6 - Concept of Yoga

1.6.1 Yoga according to different sources

Yoga is an ancient, Indian science that has evolved over thousands of years. Yoga which is considered to be a tool for both physical and mental development of an individual is being

recognized round the globe only in the last century although it was practiced in India over several centuries to promote positive health and well being (Nagendra HR, Nagarathna R, 1983) (can you cite your source for this statement?). For the restless mind it gives solace (Bloomfield, Cain, Jaffe, 1975). For the sick, it is a boon (Brena, Garde, 1975; Kuvalayananda, Swami, Venekar, 1971; Yogendra, 1972; Swami 1965). For the common man it is the fashion of the day to keep fit and beautiful (Pratinidhi, 1966). Some use it for developing memory, intelligence and creativity (Bloomfield, Cain, Jaffe, Denniston, Williams 1975). With its multifold advantages it is becoming a part of education (Denniston, Williams, Swami, 1975). Specialists use it to unfold deeper layers of consciousness in their move towards spiritual perfection. (Nirmala 1978; Ramatirtha, Swami, 1956). It deals with the physical, mental, moral and spiritual wellbeing of an individual (Iyengar, 1968). The earliest systematic description of this practice was in the classic treatise, the “Yoga Sutras” of Patanjali, dating back to 900 B.C. (Taimini, 1986). This pragmatic description enumerates eight stages of yoga, which if practiced systematically allows one to attain a state of super consciousness (*Samadhi*).

According to Yoga philosophy, human life span has been divided into three stages (*avasthas*): (i) childhood (*balya*), (ii) adulthood (*prouda*) and (iii) old age (*vrudha*). A disciplined way of living and regular practice of yoga throughout the first two stages decides the nature of the last stage (Mukthibodhananda, 2001).

Yoga- Vāṣiṣṭa one of the useful texts on Yoga exhaustively portrays the essence of Yoga. Yoga is a skilful trick to calm down the mind (Nagarathna, Nagendra, 2003). Yoga is not mere *yogāsana*, *prāṇāyāma*, or acrobatics, but is a way of life (Swami Ramatirtha, 1956). Sage Aurobindo defines yoga as a technique to achieve an all-round personality development at the physical, mental, intellectual, emotional and spiritual levels. He means, Yoga is a methodical effort towards self-perfection by the development of the potentialities latent in the individual. It is a process by

which the limitations and imperfections can be washed away resulting in a superhuman race (Satprem S, 1973, Nagarathna, Nagendra, 2003). Yoga is a term that has its root *Yuj* in *Saṁskṛta*, which means 'to join' (Nagarathna, Nagendra, 2003). According to the great sage Patañjali, Yoga is a conscious process of gaining control over the mind, which has two major steps. First step is 'to gain the capacity to focus and concentrate' and then go on to develop the ability to 'defocus or silence' the mind. By this mastery, man elevates himself consciously from the animal level to a normal man, a superman and ultimately reaches divinity itself (Nagarathna R, Nagendra HR, 2004) In action, yoga is dexterity in action which has been told in Bhagavad Gita. (Gita 2.50) The scope of Yoga as portrayed in *Bhagavadgītā* and *Upaniṣads* is far more comprehensive. Swami Vivekananda defines yoga (Nagarathna R, Nagendra HR) as, "a means of compressing one's evolution into a single life or a few months or even a few hours of one's bodily existence". In general, there is growth; that is the natural and instinctive characteristic of all animals. Man, endowed with the power to discriminate, a conscious thinking faculty *Buddhi* and well-developed voluntary controls, aspires to accelerate his growth. Yoga is that systematic conscious process which can compress the process of man's growth greatly (Nagarathna, Nagendra, 2003). The aim of yoga is to keep mind and body healthy (Nagarathna, Nagendra, 2003). Yoga is a commonly practised mind-body approach that has components centering on postures, breathing and meditation (Brena SH. 1975). Yoga which encompasses several techniques including physical postures, breathing techniques (*prāṇāyāma*) and meditation has become very popular for its applications in health starting from better physical fitness to better QoL in cancer patients (Garde RK, 1975). *Hatha Yoga Pradipika*, an ancient yoga text prescribes several techniques to prevent and manage the problems related to aging and attain immortality (Mukthibodhananda, 2001).

1.6.2 - The Four streams of Yoga

Further there are a large number of methods of yoga, catering to the needs of different persons in society to bring about the transformation of the individual. They are broadly classified into four streams. Swāmi Vivekānanda puts them as work and worship, philosophy and psychic control.

1.6.2.1 Karma Yoga - The path of work (Karma Yoga) involves doing action with an attitude of detachment to fruits of action. This makes man release himself from the strong attachments and thereby brings in him a steadiness of mind that verily is Yoga – ‘Samavatvaṁ Yoga Ucyate’ (Gita 2w.48). Instruments of action and understanding (Karmendriyās and Jnanendriyās) get cleansed.

1.6.2.2 Bhakti Yoga - The control of emotions is the key in the path of worship (Bhakti Yoga). In this modern world, man is tossed up and down due to emotional onslaughts. The path of Bhakti is a boon to gain control over emotional instabilities by properly harnessing the energy involved in it.

1.6.2.3 Jnāna Yoga - The age of science has made man a rational being. Intellectual sharpness is immanent. Analysis forms the tool. The path of Philosophy (Jnāna Yoga) is apt for the keen intellectuals and is concerned around the analysis of ‘happiness’, the vital contribution of Upaniṣadas. Also many other fundamental questions regarding the mind, the outside and inside world and the reality are taken up. Basic questions are raised even involving the intellect itself to reach the very basis of intellect.

1.6.2.4 Rāja Yoga - Culturing of mind is the key for success in almost all endeavours in our lives. The Yoga of mind culture or psychic control (Rāja Yoga) gives a practical and easy approach to reach higher states of consciousness. It is based on the Aṣṭāṅga Yoga of Patanjali’s yoga system.

Thus, the four streams of Yoga help main to develop the personality at four different levels – physical, mental, intellectual and emotional and simultaneously bring about spiritual progress.

Most of the other methods of Yoga – Laya Yoga, Japa yoga, Mantra Yoga, Hatha Yoga, Kundalini Yoga etc., are permutations and combinations of these basic methods of Yoga.

1.6.2.5 - Yoga – Its usefulness

As per the available report, 15 million people practise yoga in USA amongst which majority are women (Laura, 2003). Yoga has been found to be useful for better physical health as demonstrated by increased physical stamina as measured by hand grip strength in healthy children and adults (Raghuraj, Nagarathna, Nagendra, Telles, (1997), better finger steadiness (Dash, Telles, 1999), better lung functions (Visweswaraiiah, Telles, 2004) and autonomic stability (Orme-Johnson, 1973). Also yoga has been found to be useful for better performance in sports through stress reduction (Telles, Nagarathna, Nagendra, Desiraju, 1993).

Normal volunteers were shown to have a better sense of well-being following ten months of yoga physical postures (Ray, Mukhopadhyaya, Purkayastha, Asnani, Tomer, Prashad, Thakur, & Selvamurthy, 2001). Bera and Rajapurkar (1993) have shown that one-year yoga training in school students can improve ideal body weight, bone density and cardiovascular endurance along with a significant reduction in fat fold and body circumference measurements. Another study reported the effects of a combination of practices (śānti kriyā) on psycho physiological variables in eight middle aged healthy male volunteers. Following one month of training, there was a significant decrease in body weight, increased alpha activity of the brain, increased oral temperature and decreased respiratory rate suggesting that a combination of

yoga practices including breathing and relaxation can induce a hypermetabolic state with calm mental state (Satyanarayana, Rajeswari, Rani, Krishna, & Rao, 1992).

Practicing yoga has also been shown to improve sensory perception in volunteers across diverse age groups. Some of these observations were based on studies of auditory evoked potentials, which demonstrated that specific components occurred sooner, following yoga practices such as *prāṇāyāmas* (Telles, Joseph, Venkatesh, & Desiraju, 1992) or meditations (Telles, Nagarathna, & Nagendra, 1994). There was also improved performance in the temporal (frequency) component of the critical flicker fusion frequency assessment (Ramana Vani, Nagarathna, Nagendra, & Telles, 1997; Manjunath & Telles, 1999). Another measure of visual perception that has been shown to improve following yoga was the perception of geometric illusion (Telles, Nagarathna, Ramana Vani, & Nagendra, 1997). The error or degree of illusion was less following yoga training. Apart from sensory perception, motor skills also improved following yoga. Among these, a definite improvement was shown to occur in static motor performance or the ability to hold the hand steady (Telles, Hanumanthaiah, Nagarathna, & Nagendra, 1994). Tweezer dexterity, a measure of fine motor skills also improved, which further showed a positive correlation with motivation to learn yoga (Manjunath & Telles, 1999). Other abilities that were shown to improve following Yoga are chiefly related to cognitive tasks that include spatial memory (Naveen, Nagarathna, Nagendra, & Telles, 1997), verbal memory (Manjunath & Telles, 2004), planning (Manjunath & Telles, 2001) (based on the Tower of London test), and maze learning (Telles, Vempati RP, & Reddy, 2000).

Yoga has also been used to improve the psychological well-being of an individual. The antidepressant effect of rhythmic hyperventilation at different rates of breathing (*Sudarśana kriyā Yoga* or SKY) was studied in a prospective, open, clinical trial

(Janakiramaiah, Gangadhar, Naga Venkatesha Murthy, Harish, Subbakrishna, & Vedamurthachar, 2000). This study compared the benefits of SKY with two standard treatments, viz. electroconvulsive therapy and imipramine, on untreated depressives. Even though it is not possible to conduct a double blind trial using yoga as one of the interventions (Singh, Wisniewski, Britton, & Tattersfeld, 1990) the results suggested that SKY produced lesser benefits than electroconvulsive therapy but could be considered as a potential alternative to drugs in melancholia, as a first line of treatment.

1.7 - Yoga and Health

Yoga has also been shown to be beneficial in life-style-related health problems such as Hypertension (McCaffre, Ruknui, Hatthakit, Kasetsoomboon, 2005, Jayasinghe, 2004), Asthma (Sabina, Williams, Wall, Bansal, Chupp, Katz, 2005; Manocha, 2003; Manocha, Marks, Kenchington, Peters, Salome, 2002), Anxiety neurosis (Brown, Gerbarg, 2005, Shannahoff-Khalsa, Beckett, 1996) and Depressive illness (Jorm, Christensen, Griffiths, Rodgers, 2002), Diabetes (Bijlani et al, 2005, Sahay, 1986) etc., Considering these benefits of yoga, the present study was designed to find out whether yoga can provide benefits comparable to P.E on QoL in normal healthy adults.

1.8 - Yoga and “Quality of Life”

Yoga is both a science and an art. Yoga is graceful and methodical effort towards self-perfection inside and outside. Yoga is the means for the fastest and the best growth and finally the goal itself. Hence, “Quality of life” through the practice of Yoga gets a quantum jump to the superlative degree of happiness and also all-round personality development at all levels: physical, mental, emotional, intellectual and spiritual. Further “Quality of Life” improves to an

extent one could not imagine and wonder at the change that occurred within and the outside world (Nagarathna R, Nagendra HR, 2004)

Hence the present prospective, single blind, randomized control trial was designed to evaluate the effects of “Quality of Life” by using two complimentary ancient Indian sciences viz., Yoga and Physical Exercise in normal healthy volunteers.

AIMS AND OBJECTIVES

2.1 Aims of the study

A. To compile and understand the concept of “Quality of Life” and identify the factors which can influence the “Quality of Life” according to ancient Indian scriptures, such as,

(1) Major Upaniṣads including (i) *īśāvāsya Upaniṣat* (ii) *Kena Upaniṣat* (iii) *Kaṭha Upaniṣat* (iv) *Praśna Upaniṣat* (v) *Muṇḍaka Upaniṣad* (vi) *Māṇḍūkya Upaniṣat* (vii) *Aitareya Upaniṣat* (viii) *Taittirīya Upaniṣat* and (ix) *Bṛhadāraṇyaka Upaniṣat* (x) *Chāndogya Upaniṣat* (xi) *Śvetāśvatara upaniṣat*

(2) Ancient yogic texts such as (i) *Bhagavadgītā* (ii) *Patañjali’s Yoga Sūtras* and (iii) *Haṭha Yoga Pradīpikā*.

(3) Āyurveda Samhitās: including (a) *Caraka Samhitā* (b) *Vāgbhaṭṭa’s Aṣṭāṅga Hṛdayam*.

B. To evaluate the effects of Yoga and Physical exercise on ‘Quality of Life’ through a randomized control trial in normal adults.

2.2 Relevance of the study

The present age of speed and competition has increased the stresses and strains resulting in increasing prevalence of lifestyle-related health problems posing a new challenge. Further, lot of corruption, crimes, and psychosomatic ailments have been increasing day by day. The cause is due to poor “Quality of life”. This trend is likely to continue in the future. Hence the “Quality of life” and health is assuming greater importance and it is desirable to scientifically evaluate traditional methods that can influence quality of life and promotion of positive health.

2.3 Hypotheses

H₀: 1. There will be no significant improvement in quality of life in normal healthy adults after the practice of yoga.

2. The changes in quality of life after yoga practices will be lower than the effects seen after physical exercises.

This is tested against the alternative hypothesis:

H_A: 1. As a result of Yoga Intervention, there will be a significant improvement in “Quality of Life

2. The quality of life measures after the integrated yoga practices in normal healthy adults will be either equal to or better than physical exercises

LITRATURE SURVEY

3.1 - Background and Scope

The “Quality of Life” is said to improve as man progresses from an animal existence based on instincts to a human existence based on intelligence (Nagendra, 2000). Our scriptures go one step further by saying that the achievement of full perfection of the self or liberation from bondage merging ultimately with the Divine is the destination and the degree to which this is achieved is the “Quality of Life” (Gundappa, 1998). Unlike the biomedical model, holistic health can take a much broader view of what constitutes health and the responsibility of helping restore an individual health (Narayana Reddy, 2000). Perceptions about the “Quality” of one’s life get manifested in the adulthood (City Council Website 2001).

It is worth noting that all ancient scriptures such as the *Vedas*, *Upaniṣads*, *Sūtras* etc., were originally not in written form but memorized and transmitted from teacher to pupil by word of mouth. The Vedic corpus is what has been dubbed a mnemonic literature and examples of such expositions are *Dharmaśāstras*. Even today, this culture has been evidenced by spiritual scholars who can recite from memory, one or more *sāṃhitās* (sections of the Vedas) or the entire *purāṇas* (large collections of mythological descriptions) each comprising of thousands of verses. This extraordinary ability has been attributed not only to their style of learning but also to the special and subtle features of the mind that have been detailed below.

According to *Yoga Vasiṣṭha* (Atreya & Samvid, 1993) a philosophical ground text on yoga, attributed to *Maharṣi Vasiṣṭha*, the mind is the basic fabric of creation. Various manifest and unmanifest layers of mind constitute this creation. Mind has been said to have four facets i.e., *Manas*, *Buddhi*, *Ahaṅkāra* and *Citta*. *Manas* is often correlated with the mind. It has been defined as ‘*Saṅkalpavikalpātmake Manaḥ*’, the resolved and ever changing processes are often referred to as *manas*. *buddhi* (intellect) sorts out the information that is newly acquired, analyzes and forwards it for further action. The intellect with its power of discrimination sorts out the

thoughts and connects all other thoughts that are related to a subject. This process involves concentration. The third facet of mind is the *citta* that has been regarded as the storehouse of all past impressions called *samskāras* and newly generated impressions called *vāsanās*. At the background of all these states of mind is the *ahaṅkāra*, the 'I' - principle that governs all actions performed by every individual. These four facets put together constitute the *Antahkaraṇa* (inner tools of perception).

Thus, all actions performed by an individual are governed by the *samskāras*. As long as the *samskāras* are present, the seed for activity remains. Therefore, the ancient scriptures proclaim that the spiritual evolution completes only when all *samskāras* are cleared. They remain as obstacles to liberation. Sage *Patañjali* describes the final goal of every being is to transcend in the plane of spiritual evolution to reach the final state which is featured by absolute bliss with no past impressions (*samskāras*) i.e., *Nirbīja Samādhi* (Prabhavananda, 2002).

Hence in order to attain this goal, "Quality of Life" plays a very important role in everyone's life. As much as it is important for a spiritual seeker to clear the past impressions to attain liberation, equally important is the proper perception and cognition for an individual at a mundane level for better functioning. Apart from several external factors that can influence the "Quality of Life" of an individual, the internal factor is also very important. Hence a detailed understanding about the concept of "Quality of Life" is required.

3.2 CONCEPT OF "QUALITY OF LIFE"

3.2.1 - *īśāvāsyopaniṣat*

ॐ ईशा वास्यमिदं सर्वं यत्किञ्च जगत्यां जगत् ।

तेन त्यक्तेन भुञ्जीथाः मा गृधः कस्यस्विद्धनम् ॥ (ईशा उ: १)

Om īśā vāsyamidam sarvaṁ yatkiñca jagatyāṁ jagat!

Tena tyaktena bhujjithāḥ mā gṛdhaḥ kasyasviddhanam ॥ (īśā u: 1)

This is a very profound utterance, unequivocal, and yet extremely simple. The whole universe, it tells us, is filled with the spirit of God. And our experience of the manifold, of the sense world, must be seen in the light of this abiding truth.

Finally, the first of the *īśāvāsyopaniṣat* says *mā gṛdhaḥ kasyasviddhanam* "Do not covet the wealth of another." That is a very plain statement, but it involves a number of ethical and spiritual values. It means to give up the excessive desire for wealth; yoke the mind to the good and the true, and cultivate detachment. Whatever wealth obtained by honest labour, with that learn to delight the mind and heart. Enjoy life with zest, with the fruits of own honest labour; avoid covetousness, Exploitation in any and every form must be avoided to develop your spiritual nature and ethical nature, which is the true aim of life.

3.2.2 - *Kena Upaniṣat*

तस्यै तपो दमः कर्मेति प्रतिष्ठा वेदाः सर्वाङ्गानि सत्यमायतनम् ॥ (केन उप: ४.८)

Tasyai tapo damaḥ karmeti pratiṣṭhā vedāḥ Sarvāṅgāni

satyamāyatanam ॥ (*Kena up: 4.8*)

Austerity, self-restraint and spritual practice form the foundation of Self-knowledge. The Vedas are its limbs, and truth is its abode.

Practising austerity, self-restraint and other spritual disciplines are the pratistha, the foundation of self-knowledge. Then the Vedas are limbs of Self-knowledge, because the study of Vedas helps to clear our doubts. All these – self-restraint, selfless work, and study of the scriptures – are steps leading to *cittuśuddhi*, purification of the mind. When ego-consciousness has dissolved and the mind has become pure, one attains self-knowledge and “Quality of Life” is improved and enhanced in all aspects.

As the *upaniṣat* says, truth is the very abode of Self-knowledge. It is above everything etc., Truth constitutes straightforwardness, honesty and sincerity in thought, speech, and action constitute truth. There must be a consistency and harmony between what we think and what we say and between what we say and what we do. Our thought, speech and action should have complete accord with each other.

3.2.3 - Kaṭha upaniṣat

Again *Kaṭha Upaniṣat* will give a broad outline of how a person can elevate and merge with cosmic reality and also improve his “Quality of Life”. The key for success is basically purity which can be derived from Austerity, self-restraint and spritual practice.

Consider how the ancestors (the great souls of past) lived their lives. Consider also the lives of the great souls living now. Corn grows and dies. It is the same with human beings.

He who, properly instructed by his mother, father, and teacher, performs thrice the sacrifice named after *Naciketā*, and also practices the three things – i.e., performing sacrifices, giving in charity, and studying the Vedas – he goes beyond birth and death.

In Kaṭha Upaniṣat, Part I, Chapter III, Verse 5, 8, 9 it is said:

यस्त्वविज्ञानवान्भवत्ययुक्तेन मनसा सदा ।

तस्येन्द्रियाण्यवश्यानि दुष्टाश्वा इव सारथेः ॥ (कठ उप: १ .३ .५)

Yastvavijñānavānbhavatyayuktena manasā sadā

Tasyendriyāṅyavaśyāni duṣṭhāśvā iva sārathēḥ ॥ (kaṭha up: 1 .3.5)

If the intellect is incapable of discriminating between right and wrong and is also connected with an uncontrolled mind, it is like a charioteer who has to deal with uncontrollable, vicious horses.

यस्तु विज्ञानवान्भवति समनस्कः सदा शुचिः ।

स तु तत्पदमाप्नोति यस्माद्भूयो न जायते ॥ (कठ उप: १ .३ .८)

yastu vijñānavānbhavati samanaskaḥ sadā śuciḥ

Sa tu tatpadamāpnoti yasmādbhūyo na jāyate ॥ (kaṭha up: 1 .3.8)

The person who has a discriminating intellect and also has a controlled mind is always pure (in thought, speech, and action), such a person is sure to attain his goal (of Self-knowledge).

विज्ञानसारथिर्यस्तु मनः प्रग्रहवान्नरः ।

सोऽध्वनः पारमाप्नोति तद्विष्णोः परमं पदम् ॥ (कठ उपः १ .३ .९)

Vijñānasārathiryastu manaḥ pragrahavānnaraḥ|

So'dhvanah pāramāpnoti tadviṣṇoḥ paramam padam ||

(kaṭha up: 1 .3.9)

He whose intellect, like a good chariotteer, takes him along the right path, whose mind is under the control of the intellect, and who, by virtue of such a combination, can direct his senses as he thinks best and enhances the “Quality of Life”, he can go to the other side of the world where he attains the highest goal, union with the Cosmic Self.

3.2.4 - *Praśna upaniṣat*

Any thing one has to do in life, has to lead a “Quality of Life” comprising of austerity, self-restraint and spritual practice. In this *upaniṣat*, the Guru puts this pre condition for students, if they want to study under him. Practise of austerities and self-control, study of the scriptures, and faith in the teacher and in the scriptures, lead to immortality and to go beyond fear and and better “Quality of Life”.

3.2.5 - *Muṇḍaka Upaniṣat*

The bright and pure Self within the body, that the monks with (habitual effort) and attenuated blemishes see, is attainable verily through truth, concentration, complete knowledge, and continence, practised constantly which are the facets of “Quality of Life”.

3.2.6 - Aitareya upaniṣad

In *Aitareya Upaniṣat* Part III, Chapter I, verse 2, it is said:

यदेतहृदयं मनश्चैतत् । संज्ञानमाज्ञानं विज्ञानं प्रज्ञानं मेधा दृष्टिर्धृतिर्मतिर्मनीषा जूतिः

स्मृतिः संकल्पः ऋतुरसुः कामो वश इति । सर्वाण्येवैतानि प्रज्ञानस्य नामधेयानि

भवन्ति ॥ (ऐत. उप: ३ .१ .२)

*Yadetahrdayam manaścaitat| sañjñānamājñānam vijñānam
prajñānam medhā dṛṣṭirdhṛtirmatirmanīṣā jūtiḥ smṛtiḥ saṅkalpaḥ
ṛturasuḥ kāmo vaśa itil sarvāṅyevaitāni prajñānasya namādheyāni*

bhavanti ॥ (Ait. up: 3.1.2)

It is this heart (intellect) and this mind that were stated earlier. It is sentience, rulership, secular knowledge, presence of mind, retentiveness, sense-perception, fortitude, thinking, genius, mental suffering, memory, ascertainment, resolution, life-activities, hankering, passion, and such others. All these verily are the names of Consciousness all necessary for enhanced good “Quality of Life”.

3.2.7 - Taittirīya Upaniṣat

The facets of “Quality of Life” are beautifully portrayed in this *Upaniṣat*. Do the duties according to scriptures and study the scriptures and teach them. Be honest in thought, speech and action. Live in austere life. Control the physical organs and internal organs. Maintaining the three fires used in the Agnihotra sacrifice – (Garhapatya, Ahavaniya and Dakṣiṇā), performing Agnihotra sacrifice everyday. Treat the guests with great respects. Live like a normal human being. Have children to continue family line. *Satyavāca*, of the family of *Rāthīthara* thinks that truth alone is enough. *pauruṣīṣi* feels that one should concentrate on austerities. According to *Nāka* and *Maudgalya*, only way to get bliss is through studying and teaching the scriptures.

It is stated that Self-knowledge can give liberation that can be attained by *cittaśuddhi* which can be got by karma properly done (karma yoga).

In Taittirīya Upaniṣat Part I, Chapter IX, Verse 1, it is said:

ऋतं च स्वाध्यायप्रवचने च । सत्यं च स्वाध्यायप्रवचने च । तपश्च स्वाध्यायप्रवचने
च । दमश्च स्वाध्यायप्रवचने च । शमश्च स्वाध्यायप्रवचने च । अग्न्यश्च
स्वाध्यायप्रवचने च । अग्निहोत्रं च स्वाध्यायप्रवचने च । अतिथयश्च
स्वाध्यायप्रवचने च । मानुषं च स्वाध्यायप्रवचने च । प्रजा च स्वाध्यायप्रवचने च ।
प्रजनश्च स्वाध्यायप्रवचने च । प्रजातिश्च स्वाध्यायप्रवचने च । सत्यमिति सत्यवचा
राथीतरः । तप इति तपोनित्यः पौरुशिष्टिः ॥ स्वाध्यायप्रवचने एवेति नाको

मौद्गल्यः । तद्धि तपस्तद्धि तपः ॥ (तैत्ति उपः१ .९ .१)

*Ṛtaṁ ca svādhyāyappravacane ca | satyaṁ ca svādhyāyappravacane
 ca | tapaśca svādhyāyappravacane ca | damaśca svādhyāyappravacane
 ca | śamaśca svādhyāyappravacane ca | agnyaśca svādhyāyappravacane
 ca | agnihotraṁ ca svādhyāyappravacane ca | atithayaśca
 svādhyāyappravacane ca | mānuṣaṁ ca svādhyāyappravacane ca | prajā
 ca svādhyāyappravacane ca | prajanaśca ca svādhyāyappravacane ca |
 prajātiśca svādhyāyappravacane ca | satyamiti satyavacā
 rāthītarah | tapa iti taponityah | pauruśiṣṭih | svādhyāyappravacane
 eveti nāko maudgalyah | taddhi tapastaddhi tapaḥ (Taitti up: 1 .9. 1)*

In Taittirīya Upaniṣad Part I, Chapter XI, Verse 1, 2, 3, 4, it is said:

वेदमनूच्याचार्योऽन्तेवासिनमनुशास्ति । सत्यं वद । धर्मं चर । स्वाध्यायान्मा
 प्रमदः । आचार्याय प्रियं धनमाहृत्य प्रजातन्तुं मा व्यवच्छेत्सीः । सत्यान्न
 प्रमदितव्यम् । धर्मान्न प्रमदितव्यम् । कुशलान्न प्रमदितव्यम् । भूत्यै न प्रमदितव्यम् ।

स्वाध्यायप्रवचनाभ्यां न प्रमदितव्यम् ॥ (तैत्ति उप: १ .११. १)

*Vedamanūcyācāryo 'ntevāsinamanuśāsti | satyaṁ vada | dharmam
 cara | svādhyāyānmā pramadaḥ | ācāryāya priyam dhanamāhrtya
 prajātantum mā vyavacchetsih | satyānna pramaditavyam |
 dharmānna pramaditavyam | kuśalānna pramaditavyam | bhūtyai na*

pramaditavyam | svādhyāyapraṇāṇābhyaṁ na pramaditavyam ||

(Taitti up: 1 .11. 1)

The teacher first teaches the Vedas to his disciple and then gives the following instruction: Always speak the truth according to your understanding and knowledge. Perform the duties laid down by the scriptures. Never neglect studying the scriptures. Give your teacher things he needs and likes (when your teacher so directs, marry and raise a family). See that there is no break in the family line. Never deviate from truth. Never neglect doing the things the scriptures prescribe. Don't neglect doing what is needed for self-defence, and don't neglect doing what is good for you. Once again, don't neglect reading the scriptures and teaching them to others (carry out these duties as best you can.)

देवपितृकार्याभ्यां न प्रमदितव्यम् । मातृदेवो भव । पितृदेवो भव । आचार्यदेवो भव ।

अतिथिदेवो भव । यान्यनवद्यानि कर्माणि तानि सेवितव्यानि । नो इतराणि ।

यान्यस्माकं सुचरितानि । तानि त्वयोपास्यनि ॥ (तैत्ति उप: १ .११ .२)

नो इतराणि । ये के चास्मच्छ्रेयांसो ब्राह्मणाः । तेषां त्वयाऽऽसनेन प्रश्वसितव्यम् ।

श्रद्धया देयम् । अश्रद्धयाऽदेयम् । श्रिया देयम् । हिया देयम् । भिया देयम् । संविदा

देयम् । अथ यदि ते कर्मविचिकित्सा वा वृत्तविचिकित्सा वा स्यात् ॥

(तैत्ति उप: १ .११ .३)

ये तत्र ब्राह्मणाः संमर्शिनः । युक्ता आयुक्ताः । अलूक्षा धर्मकामाः स्युः । यथा ते तत्र
वर्तेरन् । तथा तत्र वर्तेथाः । अथाभ्यख्यातेषु । ये तत्र ब्राह्मणाः संमर्शिनः । युक्ता
आयुक्ताः । अलूक्षा धर्मकामाः स्युः । यथा ते तेषु वर्तेरन् । तथा तेषु वर्तेथाः । एष
आदेशः । एष उपदेशः । एषा वेदोपनिषत् । एतदनुशासनम् । एवमुपासितव्यम् ।

एवमु चैतदुपास्यम् ॥ (तैत्ति उपः १ .११ .४)

Devapitrkāryābhyām na pramaditavyam | māṭṛdevo bhava |

pitṛdevo bhava | ācāryadevo bhava | atithidevo bhava |

yānyanavadyāni karmāṇi tāni sevitavyāni | no itarāṇi

yānyasmākaṁ sucaritāni | tani tvayopāsyāni ॥ (Taitti up: 1 .11.2)

No itarāṇi | ye ke cāsmacchreyāṁśsobrāhmaṇāḥ | teṣāṁ

tvayā''sanena praśvasitavyam | śraddhayā deyam |

aśraddhayā'deyam | śriyā

deyam | hriyā deyam | bhiyā deyam | saṁvidā deyam | atha yadi te

karmavicikitsā va vṛttavicikitsā vā syāt ॥ (Taitti up: 1 .11.3)

*Ye tatra brāhmaṇāḥ sammarśinaḥ| yuktā āyuktāḥ| alūkṣā
dharmakāmāḥ syuḥ| yathā te tatra varteran| tathā tatra vartethāḥ|
athābhyākhyāteṣu| ye tatra brāhmaṇāḥ sammarśinaḥ| yukta
āyuktāḥ| alūkṣā dharmakāmāḥ syuḥ| yathā te teṣu varteran| tathā
teṣu vartethāḥ| eṣa ādeśaḥ| eṣa upadeśaḥ| eṣā vedopaniṣat|
etadanuśāsanam| evamupāsitavyam| evamu caitadupāsyam ॥ (Taitti*

up: 1 .11.4)

Do not neglect your duties to the gods and the ancestors. Treat your mother as God. Treat your father as God. Treat your teacher as God. Treat your guest as God. Do only things no one can find fault with, and avoid other things. Anything good we (your teachers) do, you should also do, but other things we do (that are not approved of by the scriptures) you should not do. If there are brahmins superior to us, you should offer them your seat and thus, see to their comfort. When you give anything to anyone, give it with due respect. Never give anything without due respect. And when you give something give it in the best manner possible. Give with humility and with fear, lest you offend the person to whom you are giving. And give with goodwill in your heart.

If you have any doubt in your mind about the propriety of what you are doing, or the manner in which you are doing it, then – if there are wise brahmins there, who are devoted to their duties, who are ready to do the right things voluntarily, who are kind straightforward, and selfless – follow whatever they do. Again, if someone questions the propriety of what those people are doing, then – if there are wise brahmins there, who are devoted to their duties, who are ready to do the right thing voluntarily, who are kind

straightforward, and selfless – follow whatever they do. This is the dictum, the advice; and the message of the Vedas. It is the command of God. This is the ideal. This is what should govern your conduct.

3.2.8 - *Chāndogya Upaniṣat*

This *Upaniṣat* mainly gives us how a person should acquire good qualities. First and foremost, a person should know the good qualities of the Sāma. But that is not enough. He should also worship the Sāma along with those good qualities. Then those qualities will soon manifest themselves in him and they will eventually become a great source of satisfaction too.

In *Chāndogya Upaniṣat* Chapter VII, Section 18, verse 1, it is said:

यदा वै मनुतेऽथ विजानाति नामत्वा विजानाति मत्वैव विजानाति मतिस्त्वेव

विजिज्ञासितव्येति मतिं भगवो विजिज्ञास इति (छा. उप: ७ .१८ .१)

Yadā vai manute'tha vijānāti nāmatvā vijānāti matvoiva vijānāti

matistveva vijijñāsītavyeti matim bhagavo vijijñāsa iti ||1||

ityāṣṭādaśaḥ khaṇḍaḥ(Chan. up: 7.18.1)

Sanatkumāra said: ‘When a person learns to think well, then he can know deeply. Without thinking well, one cannot know deeply. One knows for certain when one thinks deeply. But one must want to know how to think well.’ Nārada replied. ‘Sir, I want to know how to think well.

In *Chāndogya Upaniṣat* Chapter VII, Section 19, verse 1, it is said:

यदा वै श्रद्धात्यथ मनुते नाश्रद्धन्मनुते श्रद्धदेव मनुते श्रद्धा त्वेव विजिज्ञासितव्येति

श्रद्धां भगवो विजिज्ञास इति ॥ (छा. उप: ७ .१९ .१)

*Yadā vai śraddhātyatha manute nāśraddhanmanute śraddhadeva
manute śraddhā tveva vijijñasitavyeti śraddhām bhagavo vijijñāsa*

iti ॥ (Chan. up: 7.19.1)

Sanatkumāra said: 'When a person has respect (for what he hears), then he gives due thought to it. Without this respect he attaches no importance to what he hears. One thinks deeply over something that one respects. But one must try to attain this respect, Nārada replies, 'Sir, I want to have this respect.

In *Chāndogya Upaniṣat* Chapter VII, Section 20, verse 1, it is said:

यदा वै निस्तिष्ठत्यथ श्रद्धाति नानिस्तिष्ठञ्छ्रद्धाति निस्तिष्ठज्ञेव श्रद्धाति निष्ठा त्वेव

विजिज्ञासितव्येति निष्ठां भगवो विजिज्ञास इति ॥ (छा. उप: ७ .२० .१)

*Yadā vai nistiṣṭhatyatha śraddhāti nānistiṣṭhañchraddhāti
nistiṣṭhajñeva śraddhāti niṣṭhā tveva vijijñasitavyeti niṣṭhām*

bhagavo vijijñāsa iti ॥ (Chan. up: 7.20.1)

Sanatkumāra: 'When a person is steady and devoted to his teacher, then he has respect. Without being steady, one cannot have respect. One has steadiness when one has genuine respect and devotion. But one must seek this steadiness with great earnestness. Nārada replied, 'I seek this steadiness.'

In *Chāndogya Upaniṣat* Chapter VII, Section 21, verse 1, it is said:

यदा वै करोत्यथ निस्तिष्ठति नाकृत्वा निस्तिष्ठति कृत्वैव निस्तिष्ठति कृतिस्त्वेव

विजिज्ञासितव्येति कृतिं भगवो विजिज्ञास इति ॥ (छा. उप: ७ .२१ .१)

Yadā vai karotyatha nistiṣṭhātī nākṛtvā nistiṣṭhātī kṛtvāiva

nistiṣṭhātī kṛtistveva vijijñāsitavyeti kṛtiṁ bhagavo vijijñāsa iti ॥

(Chan. up: 7.21.1)

Sanatkumār said: 'When a person keeps doing his duty, he becomes steady. If one does not do one's duty, one cannot have steadiness. One attains steadiness by doing one's duty. But one should try to know what duty means.' Nārada replied I want to know about duty.

3.2.9 -*Bṛhadāraṇyaka Upaniṣad*

In *Bṛhadāraṇyaka Upaniṣad* Chapter I, Section 5, verse 3, it is said:

त्रीण्यात्मनेऽकुरुत इति मनो वाचं प्राणम्, तान्यात्मनेऽकुरुत, अन्यत्रमना अभूवम्,
नादर्शम्, अन्यत्रमना अभूवम्, नाश्रौषम् इति, मनसा ह्येव पश्यति, मनसा शृणोति ।

कामः सङ्कल्पो विचिकित्सा श्रद्धाऽश्रद्धा धृतिरधृतिर्हीर्धीर्भीरित्येतत्सर्वं मन एवः;

तस्मादपि पृष्ठत उपस्पृष्टो मनसा विजानाति; यः कश्च शब्दो वागेव सा । एषा

ह्यन्तमायत्ता एषा हि न; प्राणोऽपानो व्यान उदानः समानोऽन इत्येतत्सर्वं प्राण एषः;

एतन्मयो वा अयमात्मा, वाङ्मयो मनोमयः प्राणमयः ॥३॥

Trīṇyātmane'kuruta iti mano vācaṁ prāṇam, tānyātmane'kuruta;

anyatramanā abhūvam, nādarśam, anyatramanā abhūvam

nāśrauṣam iti, manasā hyeva paśyati, manasā śrṛṇoti| kāmaha

saṅkalpo vicikitsā śraddhāśraddhā

dhṛtiradhṛtirhrīrdhīrbhīrityetasarvaṁ mana evaḥ; tasmādapi

prṣṭhata upasprṣṭo manasā vijānāti; yaḥ kaśca śabdo vāgeva sā| eṣā

hyantamāyattā eṣā hi na; prāṇo'pāno vyāna udānaḥ samāno'na

ityetatsarvaṁ prāṇa eṣaḥ; etanmayo vā ayamātmā, vāṅmayo

manomayaḥ prāṇamayaha||3||

'There he fixed for himself' means the mankind, the organ of speech and the vital force; these he fixed for himself. (They say), 'My mind was elsewhere, so I did not see', 'My mind was elsewhere, so I did not hear'. For everybody sees, and hears, through the mind alone.' Desire, resolution, doubt, faith, want of faith, patience, impatience, modesty, intelligence and fear – all these are simply (forms of) the mind. Therefore, if one is touched even from behind, one discovers it through the mind. And whatever sound is there is indeed speech; because it underlies the revelation of objects, but it is not itself subject to revelation. The Prāṇa,' Apāna,' Vyāna,' Udāna,' Samāna,'– all these are only the

vital forces. This body is verily composed of these three. It is composed of these – of speech, the mind and the vital forces.

This righteousness is honey to all beings, and all beings are honey to this righteousness.

3.2.10 - Śvetāśvatara upaniṣat

त्रिरुन्नतं स्थाप्य समं शरीरं हृदीन्द्रियाणि मनसा सन्निवेश्य ।

ब्रह्मोदुपेन प्रतरेत विद्वान् स्रोतांसि सर्वाणि भयावहानि ॥ (स्वेत. उप: २ .८)

*Trirunnataṁ sthāpya samāṁ śarīraṁ hṛdīndriyāṇi manasā
sanniveśya*

Brahmoḍupena pratareta vidvān srotāṁsi sarvāṇi bhayāvahān ॥

(Svet. up: 2.8.11)

In order to attain ecstasy, one who is practising yoga will raise high the three parts of his body – the head, the neck, and the chest. They should also be in a straight line. With the help of his mind, he should focus all his senses in his heart and then use Brahman (ie., praṇava, the symbol Om) as raft to cross the frightful currents of the river of life.

समे शुचौ शर्करावह्निवालुका विवर्जिते शब्दजलाश्रयादिभिः ।

मनोनुकूले न तु चक्षुपीडने गुहानिवाताश्रयणे प्रयोजयेत् ॥ (स्वेत. उप: २ .१०)

Same śucau śarkarāvahṇivālukā vivarjite śabdajalāśrayādibhiḥ ।

Manonukūle na tu cakṣupīḍane guhānivātāśrayaṇe prayojayet ॥

(Svet. up: 2.10.11)

What sort of place is congenial for the practice of Yoga? Here is the answer to this question? The place should be even, holy, without pebbles, fire, and sand, without noise, such coming from a crowd, and not close to lakes and other sources of water. It should be pleasing to the mind and not repulsive to the sight. It should be a place such as a cave where there are no strong winds. Practise yoga in such a place.

3.3 - In Śrīmadbhagavadgītā Tattvavivecanī Chapter II Verse 55, 57, 58 it is said:

प्रजहाति यदा कामान् सर्वान् पार्थ मनोगतान् ।

आत्मन्येवात्मना तुष्टः स्थितप्रज्ञस्तदोच्यते ॥ (गीता २ .५५)

Prajahāti yadā kāmān sarvān pārtha manogatān|

Ātmanyevātmanā tuṣṭaḥ sthitaprajñastadocyate ॥ (Gītā: 2.55)

Śrī Bhagavān said: Arjuna, when one thoroughly dismisses all cravings of the mind, and is satisfied in the self through (the joy of) the self, then he is called stable of mind.

यः सर्वत्रानभिस्नेहस्तत्तत्प्राप्य शुभाशुभम् ।

नाभिनन्दति न द्वेष्टि तस्य प्रज्ञा प्रतिष्ठिता ॥ (गीता २ .५७)

Yaḥ sarvatrānabhisnehasttatprāpya śubhāśubham|

Nābhinandati na dveṣṭi tasya prajñā pratiṣṭhitā ॥ (Gītā: 2.57)

He who is unattached to everything, and meeting with good and evil, neither rejoices nor recoils, his mind is stable.

यदा संहरते चायं कूर्मोऽङ्गानीव सर्वशः ।

इन्द्रियाणीन्द्रियार्थेभ्यस्तस्य प्रज्ञा प्रतिष्ठिता ॥ (गीता २ .५८)

Yadā saṁharate cāyaṁ kūrmo'ṅgānīva sarvaśaḥ।

Indriyāṇīndriyārthebhyastasya prajñā pratiṣṭhitā (Gītā: 2.58)

When like a tortoise, which draws in its limbs from all directions, he withdraws his senses from the sense-objects, his mind is (should be considered as) stable.

Different facets of “Quality of Life” is given in the next few ślokas.

In *Śrīmadbhagavadgītā Tattvavivecanī* Chapter X Verse 4, 5, it is said:

बुद्धिर्ज्ञानमसम्मोहः क्षमा सत्यं दमः शमः ।

सुखं दुःखं भवोऽभावो भयं चाभयमेव च ॥ (गीता १० .४)

अहिंसा समता तुष्टिस्तपो दानं यशोऽयशः ।

भवन्ति भावा भूतानां मत्त एव पृथग्विधाः ॥ (गीता १० .५)

Buddhirjñānamasammohaḥ kṣamā satyaṁ damaḥ śamaḥ।

Sukhaṁ duḥkhaṁ bhavo 'bhāvo bhayaṁ cābhayameva ca ॥

(Gītā: 10.4)

Ahiṁsā samatā tuṣṭistapo dānaṁ yaśo'yaśaḥ|

Bhavanti bhāvā bhūtānaṁ matta eva pṛthagvidhāḥ ॥ (Gītā: 10.5)

Reason, right knowledge, unclouded understanding, forbearance, veracity, control over the senses and mind, joy and sorrow, evolution and dissolution, fear and fearlessness, non-violence, equanimity, contentment, austerity, charity, fame and obloquy.

In *Śrīmadbhagavadgītā Tattvavivecanī* Chapter XII Verse 13, 14, 15, 16, 17, 18, 19, 20 it is said:

अद्वेषा सर्वभूतानां मैत्रः करुण एव च ।

निर्ममो निरहंकारः समदुःखसुखः क्षमी ॥ (गीता १२ .१३)

सन्तुष्टः सततं योगी यतात्मा दृढनिश्चयः ।

मय्यर्पितमनोबुद्धिर्यो मद्भक्तः स मे प्रियः ॥ (गीता १२ .१४)

Adveṣṭā sarvabhūtānāṁ maitraḥ karuṇa eva ca|

Nirmamo nirahankāraḥ samaduḥkhasukhaḥ kṣamī ॥ (Gītā: 12.13)

Santuṣṭaḥ satatam yogī yatātmā dr̥dhaniścayaḥ।

Mayyarpitamanobuddhiryo madbhaktaḥ sa me priyaḥ ॥ (Gītā: 12.14)

He who is free from malice towards all beings, friendly and compassionate, rid of 'I' and 'mind', balanced in joy and sorrow, forgiving by nature, ever-contented and mentally united with Me, nay, who has subdued his mind, senses and body, has a firm resolve, and has surrendered his mind and reason to Me,- that devotee of Mine is dear to me.

यस्मान्नोद्विजते लोको लोकान्नोद्विजते च यः ।

हर्षामर्षभयोद्वेगैर्मुक्तो यः स च मे प्रियः ॥ (गीता १२ .१५)

Yasmānnodvijate loko lokānnodvijate ca yaḥ ।

Harṣāmarṣabhayodvegairmukto yaḥ sa ca me priyaḥ ॥ (Gītā: 12.15)

He who is not a source of annoyance to his fellow-creatures, and who in his turn does not feel vexed with fellow-creatures, and who is free from delight and envy, perturbation and fear, is dear to me.

अनपेक्षः शुचिर्दक्ष उदासीनो गतव्यथः ।

सर्वारम्भपरित्यागि यो मभक्तः स मे प्रियः ॥ (गीता १२ .१६)

Anapekṣaḥ śucirdakṣa udāsīno gataavyathaḥ।

Sarvārambhaparityāgi yo madbhaktaḥ sa me priyaḥ ॥ (Gītā: 12.16)

He who wants nothing, who is both internally and externally pure, is clever and impartial, and has risen above all distractions, and who renounces the feeling of doership in all undertakings, that devotee is dear to Me.

यो न हृष्यति न द्वेष्टि न शोचति न काङ्क्षति ।

शुभाशुभपरित्यागी भक्तिमान् यः स मे प्रियः ॥ (गीता १२ .१७)

Yo na hr̥ṣyati na dveṣṭi na śocati na kāṅkṣati

Śubhāśubhaparityagī bhaktimān yaḥ sa me priyaḥ ॥ (Gītā: 12.17)

He who neither rejoices nor hates, nor grieves, nor desires and who renounces both good and evil actions and is full of devotion, is dear to Me.

समः शत्रौ च मित्रे च तथा मानापमानयोः ।

शीतोष्णसुखदुःखेषु समः सङ्गविवर्जितः ॥ (गीता १२ .१८)

Samah śatrau ca mitre ca tathā mānāpamānayoḥ ।

Śītoṣṇasukhaduḥkheṣu samah saṅgavivarjitaḥ ॥ (Gītā: 12.18)

He who is alike to friend and foe, as well as to honour and ignominy, who remains balanced in heat and cold, pleasure and pain and other contrary experiences, and is free from attachment.

तुल्यनिन्दास्तुतिर्मौनी संतुष्टो येन केनचित् ।

अनिकेतः स्थिरमतिर्भक्तिमान्मे प्रियो नरः ॥ (गीता १२ .१९)

Tulyanindāstutirmaunī santuṣṭo yena kenacit

Aniketaḥ sthiramatirbhaktimānme priyo naraḥ ॥ (Gītā: 12.19)

He who takes praise and reproach alike, and is given to contemplation and contented with any means of subsistence, whatsoever, entertaining no sense of ownership and attachment in respect of his dwelling place and full of devotion to Me, that man is dear to Me.

ये तु धर्म्यामृतमिदं यथोक्तं पर्युपासते ।

श्रद्धधाना मत्परमा भक्तास्तेऽतीव मे प्रियाः ॥ (गीता १२ .२०)

Ye tu dharmyāmṛtamidaṁ yathoktaṁ paryupāsate

Śraddadhānā matparamā bhaktāste'tīva me priyāḥ ॥ (Gītā: 12.20)

Those devotees, however, who partake in a disinterested way of this nectar of pious wisdom set forth above, endowed with faith and solely devoted to Me, they are extremely dear to Me.

In *Śrīmadbhagavadgītā Tattvavivecanī* Chapter XIII Verse 7, 8, 11, it is said

अमानित्वमदम्भित्वमहिंसा क्षान्तिरार्जवम् ।

आचार्योपासनं शौचं स्थैर्यमात्मविनिग्रहः ॥ (गीता १३ .०७)

Amānitvamadambhitvamahimsā kṣāntirārjavam

Ācāryopāsanam śaucam sthairyamātmavinigrahaḥ ॥ (*Gītā*: 13.07)

Absence of pride, freedom from hypocrisy, non-violence, forbearance, straightness of body, speech and mind, devout service of the preceptor, internal and external purity, steadfastness of mind and control of body, mind and the senses.

इन्द्रियार्थेषु वैराग्यमनहंकार एव च ।

जन्ममृत्युजराव्याधिदुःखदोषानुदर्शनम् ॥ (गीता १३ .०८)

Indriyārtheṣu vairāgyamanahaṅkāra eva ca

Janmamṛtyujarāvvyādhiduhkhadoṣānudarśanam ॥ (*Gītā*: 13.08)

Dispassion towards the objects of enjoyment of this world and the next, and also absence of egotism, pondering again and again on the pain and evils inherent in birth, death, old age and diseases.

अध्यात्मज्ञाननित्यत्वं तत्त्वज्ञानार्थदर्शनम् ।

एतज्ज्ञानमिति प्रोक्तमज्ञानं यदतोऽन्यथा ॥ (गीता १३ .११)

Adhyātmajñānanityatvaṁ tattvajñānārthadarśanam।

Etajñānamiti proktamajñānam yadato'nyathā ॥ (Gītā: 13.11)

Fixed in self-knowledge and seeing God in the object of true knowledge; all this is declared as knowledge: and what is other than this is called ignorance.

In *Śrīmadbhagavadgītā Tattvavivēcanī* Chapter XVI Verse 1, 2, 3, 4, 5, 6, 21, 22, 23, 24 it is said

अभयं सत्त्वसंशुद्धिर्ज्ञानयोगव्यवस्थितिः ।

दानं दमश्च यज्ञश्च स्वाध्यायस्तप आर्जवम् ॥ (गीता १६ .१)

Abhayam sattvasamśuddhirjñānayogavyavasthitiḥ।

Dānam damaśca yajñaśca svādhyāyastapa ārjavam ॥ (Gītā: 16.1)

Absolute fearlessness, perfect purity of mind, constant fixity in the yoga of meditation for the sake of Self-Realisation, and even so charity in its *Sāttvika* form, control of the senses, worship of God and other deities as well as of one's elders including the performance of Agnihotra (pouring oblation into the sacred fire) and other sacred duties, study and teaching of the Vedas and other sacred books as well as the chanting of God's names and praises, suffering hardships for the discharge of one's sacred obligations and straightness of mind as well as of the body and senses;

अहिंसा सत्यमक्रोधस्त्यागः शान्तिरपैशुनम् ।

दया भूतेष्वलोलुप्तवं मार्दवं हीरचापलम् ॥ (गीता १६ .२)

Ahiṁsā satyamakrodhastyāgaḥ śāntirapaiśunam |

Dayā bhūteṣvaloluptvaṁ mārdaṁ hrīracāpalam || (Gītā: 16.2)

Non-violence in thought, word and deed, truthfulness and geniality of speech; absence of anger even on provocation, doership in respect of actions, quietude or composure of mind, abstaining from malicious gossip, compassion towards all creatures, absence of attachment to the objects of senses even during their contact with the senses, mildness, a sense of shame in transgressing against the scriptures or usage, and abstaining from frivolous pursuits.

तेजः क्षमा धृतिः शौचमद्रोहो नातिमानिता ।

भवन्ति सम्पदं दैवीमभिजातस्य भारत ॥ (गीता १६ .३)

Tejaḥ kṣamā dhṛtiḥ śaucamadroho nātimānitā |

Bhavanti sampadaṁ daivīmabhijātasya bhārata || (Gītā: 16.3)

Sublimity, forbearance, fortitude, external purity, having enmity to none and absence of self-esteem – these are the marks of him, who is born with the divine gifts, Arjuna.

दम्भो दर्पोऽभिमानश्च क्रोधः पारुष्यमेव च ।

अज्ञानं चाभिजातस्य पार्थ सम्पदमासुरीम् ॥ (गीता १६ .४)

Dambho darpo'bhimānaśca krodhaḥ pāruṣyameva ca |

Ajñānaṁ cābhijātasya pārtha sampadamāsurīam || (Gītā: 16.4)

Hypocrisy, arrogance and pride, and anger, harshness and ignorance too, - these are the marks of him who is born with demonic properties.

दैवी सम्पद्धिमोक्षाय निबन्धायासुरी मता ।

मा शुचः सम्पदं दैवीमभिजातोऽसि पाण्डव ॥ (गीता १६ .५)

Daivī sampadvimokṣāya nibandhāyāsūrī matā |

Mā śucaḥ sampadam daivīmabhijāto'si pāṇḍava || (Gītā: 16.5)

The divine gift has been reconized as conducive to liberation, and the demoniac gift as conducive to bondage; Grieve not, Arjuna; for you are born with the divine endowment.

दौ भूतसर्गो लोकेऽस्मिन् दैव आसुर एव च ।

दैवी विस्तरशः प्रोक्त आसुरं पार्थ मे शृणु ॥ (गीता १६ .६)

Dau bhūtasargau loka'smin daiva āsura eva ca |

Daivī vistaraśaḥ prokta āsuram pārtha me śṛṇu || (Gītā: 16.6)

There are only two types of men in this world, Arjuna, - the one possessing a divine nature and the other possessing a demoniac disposition. Of these, the type possessing a divine nature has been dealt with at length; now hear in details from Me about the type possessing demoniac disposition.

त्रिविधं नरकस्येदं द्वारं नाशनमात्मनः ।

कामः क्रोधस्तथा लोभस्तस्मादेतत्त्रयं त्यजेत् ॥ (गीता १६ . २१)

Trividhaṁ narakasyedaṁ dvāraṁ nāśanamātmanaḥ।

Kāmaḥ krodhastathā lobhastasmādetattraya tyajet ॥ (Gītā: 16.21)

Desire, anger and greed – this triple gate of hell brings about the ruination of the soul.
Therefore, one should, avoid all these three.

एतैर्विमुक्तः कौन्तेय तमोद्वारैस्त्रिभिर्नरः ।

आचरत्यात्मनः श्रेयस्ततो याति परां गतिम् ॥ (गीता १६ . २२)

Eitairvimuktaḥ kaunteya tamodvāraistribhirnaraḥ।

Ācaratyātmanaḥ śreyastato yāti parāṁ gatim ॥ (Gītā: 16.22)

Freed from these three gates of hell, man works his own salvation and thereby attain the
supreme goal i.e., God.

यः शास्त्रविधिमुत्सृज्य वर्तते कामकारतः ।

न स सिद्धिमवाप्नोति न सुखं न परां गतिम् ॥ (गीता १६ . २३)

Yaḥ śāstravidhimutsrjya vartate kāmakārataḥ।

Na sa siddhimavāpnoti na sukhaṁ na parāṁ gatim ॥ (Gītā: 16.23)

Having cast aside the injunctions of the scriptures, he who acts in an arbitrary way according to his own sweet will neither attain perfection nor the supreme goal nor even happiness.

तस्माच्छास्त्रं प्रमाणं ते कार्याकार्यव्यवस्थितौ ।

ज्ञात्वा शास्त्रविधानोक्तं कर्म कर्तुमिहार्हसि ॥ (गीता १६ . २४)

Tasmācchāstram pramāṇam te kāryākāryavyavasthitau

Jñātvā śāstravidhānoktaṁ karma kartumihārhasi ॥ (Gītā: 16.24)

Therefore, the scriptures alone are your guide in determining what should be done and what should not be done. Knowing this, you ought to perform only such action as the scriptures ordain it.

In Śrīmadbhagavadgītā Tattvavivecanī Chapter XVII Verse 14, 15, 16 it is said:

देवद्विजगुरुप्राज्ञपूजनं शौचमार्जवम् ।

ब्रह्मचर्यमहिंसा च शारीरं तप उच्यते ॥ (गीता १७ . १४)

Devadvijaguruprājñapūjanam śaucamārjavam

Brahmacaryamahimsā ca śārīram tapa ucyate ॥ (Gītā: 17.24)

Worship of gods, the brāhmaṇās, one's elders and wise men, purity, straightness, continence and harmlessness – these are called bodily penance.

अनुद्वेगकरं वाक्यं सत्यं प्रियहितं च यत् ।

स्वाध्यायाभ्यसनं चैव वाङ्मयं तप उच्यते ॥ (गीता १७ . १५)

Anudvegakaram vākyaṁ satyaṁ priyahitaṁ ca yat

Svādhyāyābhyasanam caiva vāṅmayam tapa ucyate ॥ (Gītā: 17.15)

Words which cause no annoyance to others and are truthful, agreeable and wholesome, as well as the study of the Vedas and other Śāstras and the practice of repetition of the Divine Name – this is know as the austerity of Speech.

मनःप्रसादः सौम्यत्वं मौनमात्मविनिग्रहः ।

भावसंशुद्धिरित्येतत्तपो मानसमुच्यते ॥ (गीता १७ . १६)

Manahprasādaḥ saumyatvaṁ maunamātmavinigrahaḥ

Bhāvasaṁśuddhirityetattapo mānasamucyate ॥ (Gītā: 17.16)

Cheerfulness of mind, placidity, habit of contemplation on God, control of the Mind and perfect purity of inner feelings – all these are called austerity of the Mind.

In Śrīmadbhagavadgītā Tattvavivecanī Chapter XVIII Verse 6, 26, 42, 43, 44, 51, 52, 53 it is said

एतान्यपि तु कर्माणि सङ्गं त्यक्त्वा फलानि च ।

कर्तव्यानीति मे पार्थ निश्चितं मतमुत्तमम् ॥ (गीता १८ . ६)

Etānyapi tu karmāṇi saṅgam tyaktvā phalāni ca

Kartvyānīti me pārtha niścitaṁ matamuttamam ॥ (Gītā: 18.6)

Hence these acts of sacrifice, charity and penance, and all other acts too, must be performed without attachment and hope of reward: such is My best and certain conviction verdict, Arjuna.

मुक्तसङ्गोऽनहंवादी धृत्युत्साहसमन्वितः ।

सिद्धयसिद्धयोर्निर्विकारः कर्ता सात्त्विक उच्यते ॥ (गीता १८ .२६)

Muktasaṅgo'nahavādī dhr̥tyutsāhasamanvitaḥ

Siddhyasiddhyornirvikāraḥ kartā sāttvika ucyate ॥ (Gītā: 18.26)

Free from attachment, unegotistic, endowed with firmness and vigour and unswayed by success and failure – such a doer is said to be sāttvika.

शमो दमस्तपः शौचं क्षान्तिरार्जवमेव च ।

ज्ञानं विज्ञानमास्तिक्यं ब्रह्मकर्म स्वभावजम् ॥ (गीता १८ .४२)

Śamo damastapaḥ śaucaṁ kṣāntirārjavameva ca

Jñānaṁ vijñānamāstikyam brahmakarma svabhāvajam ॥

(Gītā: 18.42)

Subjugation of the mind and senses, enduring hardships for the discharge of one's sacred obligations, external and internal purity, forgiving the faults of others, straightness of mind, senses and behaviour, belief in the Vedas and other scriptures, God and life after death etc., study and teaching of the Vedas and other scriptures and realization of the truth relating to God – all these constitute the natural duty of a Brāhmaṇa

शौर्यं तेजो धृतिर्दाक्ष्यं युद्धे चाप्यपलायनम् ।

दानमीश्वरभावश्च क्षात्रं कर्म स्वभावजम् ॥ (गीता १८ .४३)

Śauryaṁ tejo dhṛtirdākṣyaṁ yuddhe cāpyapalāyanam |

Dānamīśvarabhāvaśca kṣātraṁ karma svabhāvajam || (Gītā: 18.43)

Exhibition of valour, fearlessness, firmness, cleverness and steadiness in battle bestowing gifts, and lordliness – all these constitute the natural duty of a Kṣatriya.

कृषिगौरक्ष्यवाणिज्यं वैश्यकर्म स्वभावजम् ।

परिचर्यात्मकं कर्म शूद्रस्यापि स्वभावजम् ॥ (गीता १८ .४४)

Kṛṣigaurakṣyavāṇijyaṁ vaiśyakarma svabhāvajam |

Paricaryātmakaṁ karma śūdrasyāpi svabhāvajam || (Gītā: 18.44)

Agriculture, rearing of cows and honest exchange of merchandise – these constitute the natural duty of a Vaiśya (a member of the trading class). And

service of the other classes is the natural duty even of a śūdra (a member of the labouring class).

बुद्ध्या विशुद्धया युक्तो धृत्यात्मानं नियम्य च ।

शब्दादीन् विषयांस्तत्त्वा रागद्वेषौ व्युदस्य च ॥ (गीता १८ .५१)

विविक्तसेवी लध्वाशी यतवाक्कायमानसः ।

ध्यानयोगपरो नित्यं वैराग्यं समुपाश्रितः ॥ (गीता १८ .५२)

अहंकारं बलं दर्पं कामं क्रोधं परिग्रहम् ।

विमुच्य निर्ममः शान्तो ब्रह्मभूयाय कल्पते ॥ (गीता १८ .५३)

Buddhyā viśuddhayā yukto dhr̥tyātmānaṁ niyamy ca

Śabdādīn viṣayāṁstaktvā rāgadveṣau vyudasya ca ॥ (Gītā: 18.51)

Viviktasevī ladhvāśī yataṁvākkāyamānasaḥ

Dhyānayogaparo nityaṁ vairāgyaṁ samupāśritaḥ ॥ (Gītā: 18.52)

Ahaṅkāraṁ balaṁ darpaṁ kāmaṁ krodhaṁ parigrahaṁ

Vimucya nirmamaḥ śānto brahmabhūyāya kalpate ॥ (Gītā: 18.53)

Endowed with an untarnished intellect and partaking of a light, *Sāttvika* and regulated diet, living in a lonely and undefiled place having rejected sound and other

objects of sense, having controlled the mind, speech and body by restraining the mind and senses through firmness of a *Sāttvika* type, taking a resolute stand on dispassion, after having completely got rid of attraction and aversion and remaining ever devoted to the Yoga of meditation having given up egotism, violence, arrogance, lust, anger and luxuries, devoid of the feeling of mine and tranquil of heart, - such a man becomes qualified for oneness with Brahman, who is Truth, Consciousness and Bliss.

3.4 – *Āyurveda*

3.4.1 - *Carakasamhitā Sūtra Sthāna* Chapter I Verse 41, it is said:

हिताहितं सुखं दुःखमायुस्तस्य हिताहितम् ।

मानं च तच्च यत्रोक्तमायुर्वेदः स उच्यते ॥ चरक सूत्र

Hitāhitam sukham duḥkhamāyustasya hitāhitam |

Mānam ca tacca yatroktamāyurvedaḥ sa ucyate ||

That (science) is designated as *Āyurveda* where advantageous and disadvantageous as well as happy and unhappy (states of) life alongwith what is good and bad of life, its measurement and life itself are described.

Vyāyāma (exercise) definition

In *Carakasamhitā* Chapter VII Verse 31, it is said:

शरीरचेष्टा या चेष्टा स्थैर्यार्था बलवर्धिनी ।

देहव्यायामसंख्याता मात्रया तां समाचरेत् ॥

Śarīraceṣṭā yā ceṣṭā sthairyārthā balavardhinī |

Dehavyāyāmasaṅkhyātā mātrayā tām samācaret||

Such of physical action that is desirable and is capable of bringing about bodily stability and strength is known as physical exercise. This has to be practised in moderation.

3.4.2 - In Vāgbhaṭa's Aṣṭāṅga Hṛdayam Sūtra Chapter II Verse 20, it is said:

सुखार्थाः सर्वभूतानां मताः सर्वाः प्रवृत्तयः ।

सुखं च न विना धर्मात्तस्माद्धर्मपरो भवेत् ॥२० ॥

Sukhārthāḥ sarvabhūtānām matāḥ sarvāḥ pravṛttayaḥ|

Sukhaṁ ca na vinā dharmāttasmāddharmaparo bhavet||20||

All human activities are meant for the happiness of all the living beings; such happiness is based on dharma (righteousness, right moral conduct), hence every person should adopt (follow) righteousness always.

In Vāgbhaṭa's Aṣṭāṅga Hṛdayam Sūtra Chapter II Verse 21 & 22, it is said:

भक्त्या कल्याणमित्राणि सेवेतेतरदूरगः ।

हिंसास्तेयाऽन्यथाकामं पैशुन्यं परुषानृते ॥२१ ॥

सम्भिन्नाऽलापव्यापादमभिध्यादृग्विपर्ययम् ।

पापं कर्मेति दशधा कायवाङ्मानसैस्त्यजेत् ॥२२ ॥

Bhaktyā kalyāṇamitrāṇi sevetetaradūragah |

Himsāsteyā'nyathākāmaṁ paśunyaṁ paruṣāṅṛte ||21||

Sambhinnā'lāpavyāpādamabhidhyāḍṛgviṣayayam |

āpaṁ karmeti daśadhā kāyavāṅmānasaistyajet ||22||

Friends should be served with affection and good deeds (beneficial acts) whereas other (foes, wicked persons) should be kept at a distance. *Himsā* (causing injury, torture etc.,) *steyā* (stealing robbing) *anyathākāma* (unlawful sex activity), *paśunya* (abusive or harsh speech) *anṛtavacana* (scolding, speaking untruth), *sambhinnālāpa* (abusive or harsh speech) *anṛtavacana* (scolding, speaking untruth), *sambhinnālāpa* (speech causing diversion, separation, breaking of company), *vyāpāda* (quarrel, intention of harming) *abhidhyā* (jealousy, not tolerating good of others) and *ḍṛgviṣayayam* (finding fault, misunderstanding, faithlessness etc., with scriptures, elders etc.,) these ten sins pertaining to the body, speech and mind should be avoided.

In Vāgbhaṭa's Aṣṭāṅga Hṛdayam Sūtra Chapter II Verse 23, it is said:

अवृत्तिव्याधिशोकाऽऽर्त्ताननुवर्तेत शक्तिनः ।

आत्मवत्सततं पश्येदपि कीटपिपीलिकम् ॥२३ ॥

Avṛttivyādhiśokā'ṛttānanuvarteta śaktinaḥ |

Ātmavatsatataṁ paśyedapi kīṭapipīlikam ||23||

Those who have no means of livelihood, who are suffering from diseases and who are afflicted with grief should be helped (to get over their troubles) to the utmost extent.

Even the insects and ants should be treated with compassion and kindness (just as one's own self).

In Vāgbhaṭa's Aṣṭāṅga Hṛdayam Sūtra Chapter II Verse 25, it is said:

उपकारप्रधानः स्यादपकारपरेऽप्यरौ ।

सम्पद्विपत्स्वेकमना हेतावीर्ष्येत्फले न तु ॥२५॥

Upakārapradhānaḥ syādapakārapare'pyarau

Sampadvipatsvekamanā hetāvīrṣyetphale na tu||25||

One should be very helpful even to his foes, even though they are not helpful. One should maintain a single mind (balanced mind) during (the period of) wealth as well as during (period of) calamity one should be envious of the cause (of wealth, happiness, well-being etc., of others) but not be jealous of the effect (money, happiness).

In Vāgbhaṭa's Aṣṭāṅga Hṛdayam Sūtra Chapter II Verse 26, it is said:

काले हितं मितं ब्रूयादविसंवादि पेशलम् ।

पूर्वाभिभाषी सुमुखः सुशीलः करुणामृदुः ॥२६॥

Kāle hitam mitam brūyādavisavādi peśalam

pūrvābhibhāṣī sumukhaḥ suśīlaḥ karuṇāmṛduḥ||26||

One should speak appropriate to the occasion, with words that are good, in brief, which is not untrue and which is pleasing.

In Vāgbhaṭa's Aṣṭāṅga Hṛdayam Sūtra Chapter II Verse 27, it is said:

नैकः सुखी न सर्वत्र विश्राब्धो न च शङ्कितः ।

न कञ्चिदात्मनः शत्रुं नात्मानं कस्यचिद्रिपुम् ॥२७ ॥

Naikaḥ sukhī, na sarvatra viśrābdho, na ca śaṅkitaḥ।

Na kañcidātmanaḥ śatruṁ nātmānaṁ kasyacidripum||27||

One should start conversing with others first, with a pleasant face, should be virtuous, kind and soft (mild), should not be comfortable and happy alone, should make others also like himself, should neither believe everybody nor suspect everyone; should not reveal that same one is his foe and that he is an enemy of some one else, should not make public the insult he had and the disaffection towards the master (his own insults from his master or of his master towards him).

In Vāgbhaṭa's Aṣṭāṅga Hṛdayam Sūtra Chapter II Verse 28, it is said:

प्रकाशयेन्नापमानं न च निःस्नेहतां प्रभोः ।

जनस्याऽऽशयमालक्ष्य यो याथा परितुष्यति ॥२८ ॥

prakāśayennāpamānaṁ na ca niḥsnehatāṁ prabhoḥ।

janasyā''śayamālakṣya yo yāthā parituṣyati||28||

Keeping in mind the nature of the people, one should deal with them in such manner as best pleasing to them, becoming well versed in the art of adoring others.

In Vāgbhaṭa's Aṣṭāṅga Hṛdayam Sūtra Chapter II Verse 29, it is said:

तं तथैवाऽनुवर्तेत पराराधनपण्डितः ।

न पीडयेदिन्द्रियाणि न चैतान्यतिलालयेत् ॥२९॥

Tam tathaiivā'nuvarteta parārādhanapaṇḍitaḥ।

Na pīḍayedindriyāṇi na caitānyatilālayet।।29।।

The sense organs should neither be troubled (stained) very much nor should

they be coaxed very much.

In Vāgbhaṭa's Aṣṭāṅga Hṛdayam Sūtra a Chapter II Verse 30, it is said:

त्रिवर्गशून्यं नाऽरम्भं भजेत्तं चाविरोधयन् ।

अनुयायात्प्रतिपदं सर्वधर्मेषु मध्यमाम् ॥३०॥

Trivargaśūnyam nā'rambham bhajettam cāvirodhayan।

Anuyāyātpratipadam sarvadharmeṣu madhyamām।।30।।

One should not engage himself in occupations that are devoid of the three pursuits: dharma (righteousness) artha (wealth) and kāma (pleasure): should carry in the occupation without going contrary to them (dharma and kāma).

3.5 - Sage Patañjali

In The Science of Yoga, Chapter II Verse 29, 30 & 32 it is said:

यमनियमासनप्राणायामप्रत्याहारधारणाध्यानसमाधयोऽष्टवङ्गानि

॥(प.यो. सू. २. २९) ॥

*Yama-niyamāsana-prāṇāyāma-pratyāhāra-dhāraṇā-dhyāna-
samādhayo'ṣṭāvāṅgāni* || (PYS: 2.29) ||

The sādhana consists of: Self –restraint, fixed observances, postures, regulation of breath, abstraction, concentration, contemplation, and trance are the eight parts of the self-disciplines of Yoga.

अहिंसासत्यास्तेयब्रह्मचर्यापरिग्रहा यमाः ॥ (प.यो. सू. २ .३०) ॥

Ahimsā-satyāsteya-brahmacaryāparigrahā yamāḥ || (PYS: 2.30) ||

Vows of self-restraint comprise abstention from violence, falsehood, theft, incontinence and acquisitiveness.

शौचसंतोषतपःस्वाध्यायेश्वरप्रणिधानानि नियमाः ॥ (प.यो. सू. २ .३२) ॥

Śauca-santoṣa-tapaḥ-svādhyāyeśvara-praṇidhānāni niyamāḥ

|| (PYS: 2.32) ||

Purity, contentment, austerity, self-study and self surrender constitute Niyamas.

Results of the good “Quality of Life” according to yoga Sūtras of Patañjali in The Science of Yoga, Chapter II Verse 35, 36, 37, 38, 39, 40, 41, 42, 43, 44 & 45 it is said:

अहिंसाप्रतिष्ठायां तत्सन्निधौ वैरत्यागः ॥ (प. यो. सू. २ .३५) ॥

Ahimsāpratiṣṭhāyām tatsannidhau vairatyāgaḥ || (PYS. II. 35)

On being firmly established in ahimsā, there is abandonment of hostility in his vicinity.

सत्यप्रतिष्ठायां क्रियाफलाश्रयत्वम् ॥ (प. यो. सू. २ .३६) ॥

Satyapraṭiṣṭhāyām kriyāphalāśrayatvam ॥ (PYS. II. 36) ॥

On being firmly established in truthfulness, the actions result in fruits, entirely depending on it.

अस्तेयप्रतिष्ठायां सर्वरत्नोपस्थानम् ॥ (प. यो. सू. २ .३७) ॥

Asteyapraṭiṣṭhāyām sarvaratnopasthānam ॥ (PYS. II. 37)

On being firmly established in honesty, all gems present themselves.

ब्रह्मचर्यप्रतिष्ठायां वीर्यलाभः ॥ (प. यो. सू. २ .३८) ॥

Brahmacaryapraṭiṣṭhāyām vīryalābha ॥ (PYS. II. 38) ॥

On being firmly established in brahmacharya, vīrya is gained.

अपरिग्रहस्थैर्ये जन्मकथन्तासम्बोधः ॥ (प. यो. सू. २ .३९) ॥

Aparigrahasthairye janmakathantāsambodhaḥ ॥ (PYS. II. 39)

On being steady in non-possessiveness, there arises the knowledge of how and from where birth (comes).

शौचात् स्वाङ्गजुगुप्सा परैरसंसर्गः ॥ (प. यो. सू. २ .४०) ॥

Śaucāt svāṅgajugupsā parairasamsargaḥ ॥ (PYS. II. 40) ॥

From cleanliness there comes indifference towards body and non attachment to others.

सत्त्वशुद्धिसौमनस्यैकाग्र्येन्द्रियजयात्मदर्शनयोग्यत्वानि च

॥ (प. यो. सू. २ .४१) ॥

Sattvaśuddhisaumanasyaikāgryendriyajayātmadarśanayogyatvāni

ca ॥ (PYS. II. 4) ॥

By the practice of mental purity one acquires fitness for cheerfulness, one-pointedness, sense control and vision of the self.

संतोषादनुत्तमः सुखलाभः ॥ (प. यो. सू. २ .४२) ॥

Santoṣādanuttamaḥ sukhālābhaḥ ॥ (PYS. II. 42) ॥

कायेन्द्रियसिद्धिरशुद्धिक्षयात् तपसः ॥ (प. यो. सू. २ .४३) ॥

Kāyendriyasiddhiraśuddhikṣayāt tapasaḥ ॥ (PYS. II. 43) ॥

By practising austerities, impurities are destroyed and there comes perfection in the body and sense organs.

स्वाध्यायादिष्टदेवतासम्प्रयोगः ॥ (प. यो. सू. २ .४४) ॥

Svādhyāyādiṣṭadevatāsamprayogaḥ ॥ (PYS. II. 44) ॥

By self-observation, union with the desired deity is brought about.

समाधिसिद्धिरीश्वरप्रणिधानात् ॥ (प. यो. सू. २ .४५) ॥

Samādhisiddhirīśvarapraṇidhānāt ॥ (PYS. II. 45) ॥

Success in trance comes by complete resignation to God.

3.6 - Haṭha Yoga Pradīpikā of Svātmārāma:

In Four Chapters on Freedom Chapter I Verse 16 (ii & iii), it is said:

अहिंसा सत्यमस्तेयं ब्रह्मचर्यं क्षमा धृतिः ।

दयार्जवं मिताहारः शौचं चैव यमा दश ॥ १.१६ ॥

Ahimsā satyamasteyaṁ brahmacarya kṣamā dhṛtiḥ ।

dayārjavaṁ mitāhāraḥ śaucaṁ caiva yamā daśa ॥ 1.16 ॥

To do no harm, to speak the truth, to refrain from taking what belongs to others, to preserve confidence, to practise forbearance and fortitude, to be merciful to all, to be straightforward, to be moderate in diet and to purify oneself – these constitute Yama.

तपः संतोष आस्तिक्यं दानमीश्वरपूजनम् ।

सिद्धान्तवाक्यश्रवणं ह्रीमती च तपो हुतम् ।

नियमा दश संप्रोक्ता योगशास्त्रविशारदैः ॥ १.१६ ॥

Tapaḥ santoṣa āstikyaṁ dānamīśvarapūjanam ।

Siddhāntavākyaśravaṇam hrīmatī ca tapo hutam ।

Niyamā daśa samproktā yogaśāstraviśāradaiḥ ॥ 1.16 (iii) ॥

Tapas (austerities) cheerfulness, belief in God (āstikya), Charity, worship of the Deity, hearing the exposition of Vedantic doctrines, moderate, sound mind, japa (repeating prayers) and vratas (observance of vows) – these constitute Niyama.

3.7 Summary

The concept of “Quality of life” in yoga and spiritual lore takes into consideration the holistic perspective of an individual. The traditional approach adopts the five-layered existence of man (Gambhirananda, 1998). The first, and the most gross is the physical frame, i.e., the *Annamaya kośa* (physical sheath). The second (life energy body) is the *Prāṇamaya kośa* characterized by predominance of *prāṇa*, the life principle. The next sheaths in the order of subtlety are: *Manomaya kośa* (mental sheath), *Vijñānamaya kośa* (intellectual sheath), and *Ānandamaya Kośa* (sheath of bliss). As the sheaths become subtler, the freedom of operation increases, bondage decreases, and bliss associated with it multiplies. While in *Manomaya kośa* the creative power predominates, in *Vijñānamaya kośa*, it is the power to discern and discriminate. Bliss is embodied in *Ānandamaya kośa*, the highest stage of evolution. In his journey towards Ultimate, man crosses these sheaths of existence one by one. Through analysis known as *Pañca kośa viveka* (knowing through experience of the five sheaths of existence) and the associated practices called *Tapas*, an individual is transformed by getting relieved from the bondages and constrictions of each sheath. This is one of the ways of reaching the ultimate goal described in the *Upaniṣads* (Gambhirananda, 1998).

In *Annamaya kośa* (physical layer of existence) “Quality of Life” plays a very important role in molding the physical personality. But the spiritual texts take different stand point with respect to the concept of “Quality of life”. The normal mind with limited memories can only create a world from experience as in the dream state. But subtler and deeper memories can create an even more ‘real’ world. It is the mind that can create and destroy the whole world says *Yoga Vāsiṣṭha*. The whole Universe is pervaded by

Brahman. Emerging from Brahman, the mind by its power shows up as Universe. Thus, the whole creation is a construct of mind. There have been great Yoga masters who have shown up amazing abilities to memorise, passing through the limitations of time and space, associated with such memories to change their physical existence, allow the body to disappear, create a new body, multiple existence etc. all coming under the name of *siddhis* or supernatural powers. Thus even the brain a physical store house of memory has been believed to be a construct of mind.

Based on the wisdom of *Upaniṣads* described above, it is evident that a total understanding of “Quality of life” should take the entire existence of human system into consideration, and not limit itself to the physical body alone.

In *Prāṇamaya kośa* memories are concerned with the vegetative and instinctual activities. They are stored at the grosser level (instincts) but overpowered by subtler stores of memory and by higher *samskāras*.

In *manomaya kośa*, memory is classified as *vāsanā* (superficial) and *samskāra* (deeprooted). The former is due to habituation while *samskāras* are associated with emotions. As mentioned earlier, it is the mind that can create and destroy the whole world and the whole creation is a construct of mind.

In *Vijñānamaya kośa*, “Quality of Life” is based on analysis, discrimination and understanding. Individual's understandings also expand and becoming increasingly comprehensive and his ability to remember increases. The very tendency to think, act

and enjoy is again the subtlest of the memory layers. They are called *vāsanās* (tendency).
When even this tendency vanishes, mastery emerges which is a state of highest freedom.

3.8 *Jīvana Sūtrās*

Based on the scriptures, we can summarise in the form of 18 Sutras which can be called as *Jīvana sūtrās* which will help to enhance Quality of Life.

सत्यम् वद । अनृतं मा वद ॥१॥

Satyam vada| anṛtaṁ mā vada||1||

Always speak truth. Don't tell untruth.

सज्जनानां सुकार्यं अनुकरणं कुरु । गौरवं ददातु ॥२॥

Sajjanānām sukāryam anukaraṇaṁ kuru| gauravaṁ dadātu||2||

Follow good people. Give them respect.

सार्वजनिक वाहने एव गच्छतु ॥३॥

Sārvajanika vāhane eva gacchatu||3||

Always use public transport.

दैनन्दिन कार्ये कर्मयोगं योजयतु ॥४॥

Dainandiona kārye karmayogaṁ yojayatulu||4||

Adopt karmayoga in day to day activities.

प्रतिदिनं निर्दिष्ट समये योगासनं प्राणायामं करोतु ॥५॥

Pratidinaṁ nirdiṣṭa samaye yogāsanaṁ prāṇāyāmaṁ karotulu||5||

Daily do yogāsana and prāṇāyāmaṁ at fixed time.

दरिद्राणां जन्तुनां च विषये अनुकम्पं दयां च दर्शयतु ।६॥ ।

Daridrāṇāṃ jantunāṃ ca viṣaye anukampañ dayāṃ ca darśayatu।6।।।

Show compassion towards poor people and animals.

परिसरे मालिन्यं मा कुरु । स्वच्छं कुरु ॥७॥

Parisare mālinyaṃ mā kuru। svacchaṃ kuru।7।।

Don't pollute the surrounding. Always clean the surrounding.

जलं व्यर्थं मा कुरु ॥८॥

Jalaṃ vyarthaṃ mā kuru।8।।

Don't waste water.

वायु मालिन्यं मा कुरु ॥९॥

Vāyu mālinyaṃ mā kuru।9।।

Don't pollute air.

स्वाध्याय प्रवचनं प्रतिदिनं करोतु ॥१०॥

Svādhyāya pravacanāṃ pratidinaṃ karotu।10।।

Daily do self study and teach.

धूम्रपानात् मदिरसेवनात् बुद्धिनाशः ॥११॥

Dhūmrāpānāt madirasevanāt buddhināśaḥ।11।।

Smoking and drinking will harm buddhi.

आलस्यं त्यजतु । ॥१२॥

Ālasyaṃ tyajatu।12।।

Don't be lazy.

सर्वदा शीघ्रं उत्थाय शीघ्रं शयनं करोतु ।१२ ॥

Sarvadā śīghram utthāya śīghraṁ śayanaṁ karotu|12||

Daily get up early and sleep early.

सात्विक आहरमेव स्वीकरोतु ।१४ ॥

Sātvika āhameva svīkarotu|14||

Take only sātвика food

शास्त्र विषये श्रद्धा एधतु ।१५ ॥

Śāstra viṣaye śraddhā edhatu|15||

Have faith in scriptures.

सात्विक जीवनं करोतु ॥१६ ॥

Sātvika jīvanaṁ karotu||16||

Lead sātвика life.

पुरुषार्थमय जीवनं करोतु ॥१७ ॥

Puruṣārthamaya jīvanaṁ karotu||17||

Lead a life of fruitfulness.

विद्युत् व्यर्थं मा करोतु ॥१८ ॥

Vidyut vyartham mā karotu||18||

Don't waste electricity.

Understanding “Quality of Life” is today particularly important in health care, where monetary measures do not readily apply. Decisions on what research or treatments to invest the most in are closely related to their effect on a patient's “Quality of Life”.

The best way of approaching “Quality of Life” measurement is to measure the extent to which people's 'happiness requirements' are met – ie., those requirements which are a necessary (although not sufficient) condition of anyone's happiness - those 'without which no member of the human race can be happy (McCall S, 1975). “Quality of Life” is a multi-dimensional concept involving physical, individual and social dimensions (Cohen, 1989). In general terms the “Quality of Life” as per the widely accepted definition is - “an individual’s perceptions of well-being that stem from satisfaction or dissatisfaction with dimensions of life that are important to the individual” (Ferris, 1985) and in terms of health it is - “a pragmatic, day-to-day, functional representation of a patient’s physical, psychological, and social response to a disease and its treatment” (Schipper, 1990).

“Quality of Life” may also be defined as subjective well-being. Recognising the subjectivity of “Quality of Life” is a key to understanding this construct. “Quality of Life” reflects the difference, the gap, between the hopes and expectations of a person and their present experience. Human adaptation is such that life expectations are usually adjusted so as to lie within the realm of what the individual perceives to be possible. This enables people who have difficult life circumstances to maintain a reasonable “Quality of Life”. – (*Janssen Quality-of-life Studies*). “Quality of Life” is tied to perception of 'meaning'. The quest for meaning is central to the human condition, and we are brought in touch with a sense of meaning when we reflect on that which we have created, loved, believed in or left as a legacy (Frankl, 1963). “Quality of Life” Research Unit, University of Toronto defines the “Quality of Life” as the degree to which a person enjoys the important possibilities of his/her life. Possibilities result from the opportunities and limitations each person has in his/her life and reflect the interaction of personal and

environmental factors. Enjoyment has two components: the experience of satisfaction and the possession or achievement of some characteristic, as illustrated by the expression: "She enjoys good health." Three major life domains are identified: Being, Belonging, and Becoming. The conceptualization of Being, Belonging, and Becoming as the domains of "Quality of Life" were developed from the insights of various writers.

| | | |
|--|--|---|
| <p>The Being domain includes the basic aspects of "who one is" and has three sub-domains. Physical Being includes aspects of physical health, personal hygiene, nutrition, exercise, grooming, clothing, and physical appearance. Psychological Being includes the person's psychological health and adjustment, cognitions, feelings, and evaluations concerning the self, and self-control. Spiritual Being reflects personal values, personal standards of conduct, and spiritual beliefs which may or may not be associated with organized religions.</p> | <p>Belonging includes the person's fit with his/her environments and also has three sub-domains. Physical Belonging is defined as the connections the person has with his/her physical environments such as home, workplace, neighbourhood, school and community. Social Belonging includes links with social environments and includes the sense of acceptance by intimate others, family, friends, co-workers, and neighbourhood and community. Community Belonging represents access to resources normally available to community members, such as adequate income, health and social services, employment, educational and recreational programs, and</p> | <p>Becoming refers to the purposeful activities carried out to achieve personal goals, hopes, and wishes. Practical Becoming describes day-to-day actions such as domestic activities, paid work, school or volunteer activities, and seeing to health or social needs. Leisure Becoming includes activities that promote relaxation and stress reduction. These include card games, neighbourhood walks, and family visits, or longer duration activities such as vacations or holidays. Growth Becoming activities promote the improvement or maintenance of knowledge and skills.</p> |
|--|--|---|

| | | |
|--|-----------------------|--|
| | community activities. | |
|--|-----------------------|--|

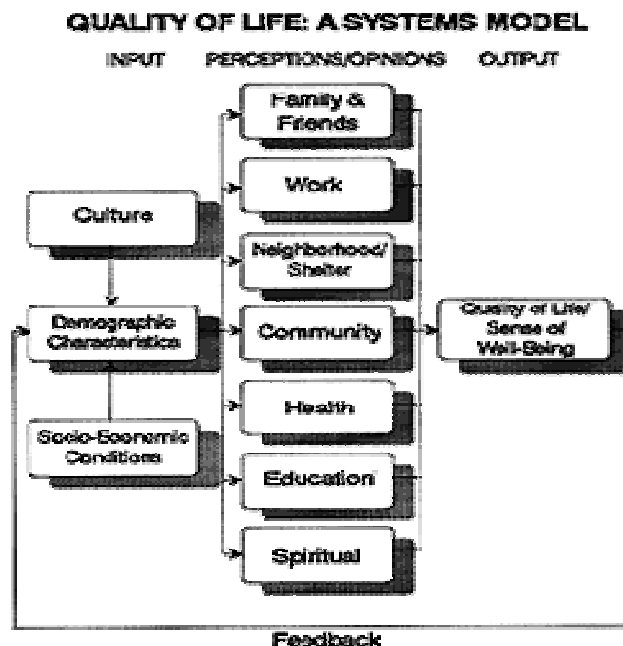
| | | |
|---|----------------------------|---|
| B E I N G | Physical Being | <ul style="list-style-type: none"> • Being physically able to get around. • My nutrition and the food I eat. |
| | Psychological Being | <ul style="list-style-type: none"> • Being free of worry and stress. • The mood I am usually in. |
| | Spiritual Being | <ul style="list-style-type: none"> • Having hope for the future. • My own ideas of right and wrong. |
| B E L O N G I N G | Physical Belonging | <ul style="list-style-type: none"> • The house or apartment I live in. • The neighbourhood I live in. |
| | Social Belonging | <ul style="list-style-type: none"> • Being close to people in my family. • Having a spouse or special person. |
| | Community Belonging | <ul style="list-style-type: none"> • Being able to get professional services (medical, social, etc.) • Having enough money. |
| B E C O | Practical Becoming | <ul style="list-style-type: none"> • Doing things around my house. • Working at a job or going to school. |
| | Leisure Becoming | <ul style="list-style-type: none"> • Outdoor activities (walks, cycling, etc.) • Indoor activities (TV, cycling, etc.) |

| | | |
|------------------|-------------------------------|--|
| M I N G | <i>Growth Becoming</i> | <ul style="list-style-type: none"> • Improving my physical health and fitness. • Being able to cope with changes in my life. |
|------------------|-------------------------------|--|

- "Quality of Life" Research Unit, University of Toronto

In "Quality of Life" research one often distinguishes between the subjective and objective "Quality of Life". Subjective "Quality of Life" is about feeling good and being satisfied with things in general. Objective "Quality of Life" is about fulfilling the societal and cultural demands for material wealth, social status and physical well-being (Quality-of-Life Research Center, Denmark)

The approach to the measurement of the "Quality of Life" derives from the position that there are a number of domains of living. Each domain contributes to one's overall assessment of the "Quality of Life". The domains include family and friends, work, neighborhood (shelter), community, health, education, and spiritual.



- The University of Oklahoma School of Social Work

There are essentially two perspectives taken in “Quality of Life” research: social indicators research which considers the elites’ valuation of what the people need, and conventional “Quality of Life” research which studies what people want, in order to improve their “Quality of Life” (Mukherjee R, 1989).

The purpose of the “Quality of Life” (“Quality of Life) Index is to provide a tool for community development which can be used to monitor key indicators that encompass the social, health, environmental and economic dimensions of the “Quality of Life” in the community. The “Quality of Life” can be used to comment frequently on key issues that affect people and contribute to the public debate about how to improve the “Quality of Life” in the community. It is intended to monitor conditions that affect the living and working conditions of people and focus community action on ways to improve health. Indicators for the “Quality of Life” include:

- SOCIAL: Children in care of Children's Aid Societies; social assistance beneficiaries; public housing waiting lists etc.
- HEALTH: Low birth weight babies; elderly waiting for placement in long-term care facilities; suicide rates etc.
- ECONOMIC: Number of people unemployed; number of people working; bankruptcies etc.
- ENVIRONMENTAL: Hours of moderate/poor air quality; environmental spills; tonnes diverted from landfill to blue boxes etc.

How does "Quality of Life" compare with 'Standards of Living'? Standards of Living is a measure of the quantity and quality of goods and services available to people. It measures such aspects as GDP Per Capita, life expectancy, Births/1000, Infant Mortality/1000, Doctors/1000, Cars/1000, TV/1000, Telephones/1000, Literacy levels, %GDP spent on Education, %GDP spent on Health, Cinema attendance, Newspaper circulation, Fertility Rate, Density, Population per dwelling, etc.

"Quality of Life" is the product of the interplay among social, health, economic and environmental conditions that affect human and social development. (Ontario Social

Development Council, 1997). **3.9.1. The 2007 Worldwide Quality of Living Survey:**

The Survey conducted by Mercer Human Resource Consulting Agency has found that four of the world's five top-scoring cities for health and sanitation are in North America. Calgary ranks top with a score of 131.7, followed by Honolulu, which scores 130.3. Helsinki – the only European city in the top five – follows closely in the rankings with a score of 128.5. Ottawa and Minneapolis take fourth and fifth places with scores of 127.2 and 125.7 respectively. Scores are based on the quality and availability of hospital and medical supplies and levels of air pollution and infectious diseases. The lowest-ranking city for health and sanitation is Baku in Azerbaijan,

which scores just 27.6. Other low-scoring cities include Dhaka in Bangladesh, Antananarivo in Madagascar and Port Au Prince in Haiti, which score 29.6, 30.1 and 34 respectively.

“Poor countries often lack adequate medical infrastructure including hospitals and health networks. Furthermore, provision of care is hampered by poor sanitation and unsafe water facilities in many areas,” said Slagin Parakatil, senior researcher at Mercer. “The development of efficient waste removal and sewage systems, coupled with government investment in medical infrastructure, will be key to avoiding pandemic outbreaks of diseases and for improving general living standards

3.9.2 Rankings for overall quality of living

Mercer’s overall ranking for quality of living has revealed that Zurich ranks as the world’s top city, with a rating of 108.1. The city narrowly out-ranks Geneva, which scores 108. Vancouver and Vienna follow in joint third place and score 107.7. Cities in Europe and Australasia continue to dominate the top end of the rankings for overall quality of living. Auckland and Düsseldorf share joint fifth place and respectively. Bern and Sydney both score 106.5 points and share joint 9th place score 107.3 points. Frankfurt and Munich follow with scores of 107.1 and 106.9.

The analysis is based on an evaluation of 39 qualities of living criteria for each city including political, social, economic and environmental factors, personal safety and health, education, transport and other public services.

Baghdad remains the world’s least enticing city for expatriates with a score of 14.5. Other low-scoring cities for overall quality of living include Brazzaville in Congo (29.5), Bangui in the Central African Republic (30.6) and Khartoum in Sudan (31).

The “Quality of Life” in the four Indian metros - Delhi, Mumbai, Bangalore and Chennai - has improved considerably since last year.

3.9.3 Attributes of “Quality of Life”

It is impossible to list all the rich array of attributes related to the concept of “Quality of Life”, but literature has mentioned the following:

Ability, Adaptation, Appreciation, Basic Needs, Belonging, Control, Demands and responsibilities, Distress, Diversity, Enhancement, Enjoyment, Environment, Expectations, Experiences, Flexibility, Freedom, Fulfillment Gaps, Gender, Happiness, Health, Hopes, Identity, Improvement, Exclusivity, Integrity/Intactness, Isolation, Judgements, Knowledge Lacks Living Conditions. Mismatches, Needs, Opportunities, Perceptions, Pleasure, Politics, Possibilities, “Quality of Life” Domain: existential, “Quality of Life” Domain: physical, ‘Quality of Life” Domain: psychological, Religion, Safe, Satisfaction, Secure, Security, Self-esteem, Society, Spirituality, Status, Stress, Truth, Well-being, Wishes, Working Conditions,

3.9.4 Use of Complimentary and Alternate Medicine in improving “Quality of Life”.

3.9.4.1 Studies on the use of Yoga

The earliest studies on Yoga in the 1920s, evaluated the effects of specific practices using sophisticated methods of that time (e.g., X-rays) (Kavalayananda, 1925). Subsequently, there were a series of studies on abilities of yogis to voluntarily regulate involuntary functions (Wenger, Bagchi, & Anand, 1961; Anand & Chhina, 1961; Anand Chhina, & Singh, 1961; Kothari, Bordia, & Gupta, 1973). However, the first widely publicized study was carried out on Transcendental meditation, which showed that this technique induces a ‘fourth major state of consciousness’, distinct from the wakeful state and two stages of sleep (Wallace, 1970; Wallace, Benson, & Wilson, 1971). Further research has increased the awareness that Yoga is a very useful mind-modifying technique with potential applications in the promotion of positive health, prevention and treatment of disease, as well as in rehabilitation.

Normal volunteers were shown to have a better sense of well-being following ten months of yoga physical postures (Ray, Mukhopadhyaya, Purkayastha, Asnani, Tomer, Prashad, Thakur, & Selvamurthy, 2001). Bera and Rajapurkar (1993) have shown that one year yoga training in school students can improve ideal body weight, bone density and cardiovascular endurance along with a significant reduction in fat fold and body circumference measurements. Another study reported the effects of a combination of practices (*shanthi kriya*) on psychophysiological variables in eight middle aged healthy male volunteers. Following one month of training, there was a significant decrease in body weight, increased alpha activity of the brain, increased oral temperature and decreased respiratory rate suggesting that a combination of yoga practices including

breathing and relaxation can induce a hypermetabolic state with calm mental state (Satyanarayana, Rajeswari, Rani, Krishna, & Rao, 1992).

3.9.4.2 Studies on Tai Chi

Wolf et al. (1996) have shown the positive effects of Tai Chi program compared to computerized balance training on specified indicators of frailty and the occurrence of falls in 200 elderly subjects aged above 70 years. Subjects were divided into two intervention groups and a control group. Following 15 weeks of Tai Chi practice subjects expressed less fear of falling compared to the control group and there was a significant reduction in the rate of falls by 47.5% in the Tai Chi group which suggested the use of Tai Chi as a preventive measure for reducing the incidence of falls in the elderly.

In another study, 110 healthy elderly community dwellers (mean age eighty years) were assessed to determine the effects of three months intensive balance or weight training followed by six months of low intensity Tai Chi training on balance and strength (Wolfson, Whipple, Derby, Judge, King, Amerman, Schmidt, & Smyers, 1996). After the preliminary three months training in

balance, strength and balance strength interventions, all subjects received long-term group Tai Chi intervention for one hour, once a week for six months. The results were suggestive of improved balance measures in the balance-training group, while the balance and strength training did not show any interaction. Tai Chi training helped them to maintain the gains of earlier programs for six months without any decrement. The benefits of Tai Chi were not limited to physical well-being of the elderly. In another study, the effects of Tai Chi Chuan (TCC) on the autonomic nervous system modulations in twenty elderly practitioners of Tai Chi was compared with an equal number of control subjects (Lu & Kuo, 2003). The spectral analysis of the heart rate variability immediately after 30 minutes and 60 minutes of the practice suggested that there was a significant increase in the high frequency power from 22.8 to 28.2 at 30 minutes and further increased to 30.6 normalized units. In contrast, the low /high frequency ratio has decreased significantly. Also, the heart rate, systolic blood pressure, diastolic blood pressure, mean arterial pressure and pulse pressure have decreased significantly following the 60-minute practice. It was inferred that TCC enhances the vagal modulation in older persons and hence can be used as a health promoting form of calisthenics for older persons. Tai Chi has also been used to improve the quality of sleep and to reduce the depression scores in elderly individuals. Li and colleagues (2004), in a randomized control trial studied the role of Tai Chi on the self-rated sleep quality in 118 older persons belonging to both sexes. The interventions were either Tai Chi or low-impact exercise practiced for sixty minutes for three times a week for 24 consecutive weeks. The Tai Chi participants reported significant improvements in five of the Pittsburg Sleep Quality Indices compared to the no intervention control group. The sleep onset latency has been shown to reduce by 18 minutes and sleep duration has increased by 48 minutes. Hence, it has been proposed that Tai Chi can be used as an effective non-pharmacological treatment modality to overcome sleep disturbances in the elderly.

3.9.4.3 Studies on Guided relaxation

In a community-based nursing study (Sloman, 2002), the effects of progressive muscle relaxation and guided imagery on anxiety, depression and “Quality of Life” in people with advanced cancer were studied. 56 cancer patients were randomly allocated to any of the four interventions viz., guided imagery, progressive muscle relaxation, combined treatment and a control group. There was a significant improvement in the depression scores and the “Quality of Life” of the three intervention groups while the control group showed no change. Another study compared the effects of individualized music with classical relaxation music on thirty nine elderly persons with Alzheimer’s disease and related disorders (Gerdner, 2000). Following six weeks of respective interventions and on crossover after two weeks there was a significant reduction in agitation during and following individualized music compared to classical music.

3.9.4.4 Studies on Meditation

3.9.4.4A Studies on the Transcendental Meditation (TM):

The TM technique is described as a simple, natural, and effortless procedure practised twice a day for 20 minutes while sitting comfortably with eyes closed (Roth, 1994). It requires no changes in beliefs, philosophy, religion, or lifestyle. Clinical reports indicate that this technique can easily be learned by individuals of any age, level of education, occupation, or cultural background (Alexander, 1993). During the practice of the TM technique, one’s awareness gradually settles down to states of lesser excitation and is eventually experienced as remaining silently awake within itself. TM practitioners report the attainment of this state, which is one of restful alertness, as an experience in which the ordinary thinking process is “transcended.” This state also serves to distinguish the TM technique from other meditation and relaxation techniques that use contemplation and concentration and thus, may increase mental activation (Orme-Johnson & Walton,1998).

Wallace and colleagues (1982) used a previously validated and standardized index of biological aging - the Morgan Adult Growth Examination (auditory discrimination, near-point vision accommodation, and systolic blood pressure) on 84 participants (mean age = 53 years). It was reported that long-term TM practitioners (> 5 years meditating) had a mean biological age 12 years younger than their mean chronological age. Short-term TM meditators were 5 years younger, and the non meditator controls were 2 years younger. TM groups differed significantly from age-matched controls. The study was controlled for the confounding effects of diet and exercise. Another study showed that both male (+23%) and female (+47%) TM participants had significantly higher levels of serum dehydroepiandrosterone sulfate (DHEAS), which has been shown to decline with age (Glaser, Brind, Vogelmann, Eisner, Dillbeck, Wallace, Chopra, & Orentreich, 1992). In a prospective randomized controlled trial in the elderly (mean age = 81) by Alexander and colleagues (1989) it was shown that the TM group showed a mean reduction of blood pressure by 12 mm Hg over a 3-month period compared to modest change or no change for the mindfulness meditation and no-treatment control group. The survival rate was 100% for the TM group while the other groups showed 67% and 85% survival rates respectively. Schneider et al. (1995) conducted a randomized, controlled, single-blind clinical trial on 127 African Americans (average age 66 years) with mild hypertension. After a 3-month follow up period in a primary care, inner-city health center, TM intervention significantly reduced systolic blood pressure by 10.7 mm Hg and diastolic blood pressure by 6.4 mm Hg. compared to a lifestyle modification education control. A parallel progressive muscle relaxation (PMR) intervention lowered systolic blood pressure by 4.7 mmHg and diastolic blood pressure by 3.3 mmHg, but TM lowered blood pressure significantly more than PMR.

3.9.4.4B Studies on Mindfulness meditation

An attempt was made to study the impact of change in state of consciousness through specific mental techniques on extending the human life and to reverse age- related declines. A

randomized controlled trial compared the effects of mindfulness meditation, TM on the advanced elderly (mean age = 81 years). Over a 3-year period, the TM group improved most, followed by mindfulness training, and then by the no-treatment and relaxation groups for the following measures: paired associate learning, two measures of cognitive flexibility, systolic blood pressure, self-ratings of behavioral flexibility and aging, multiple indicators of treatment efficacy, and mental health after 18 months. After 3 years, survival rate for TM was 100% followed by mindfulness meditation (87.5%) in contrast to mental relaxation (65%) and no treatment (77%). The baseline survival rate for the 478 nonparticipating elderly was 62.5%. A separate study demonstrated the anti-depression effect of mindfulness meditation (Sun, Wu, & Chiu, 2004).

3.9.5 Summary of review of literature:

The studies cited above provide sufficient evidence to suggest that Yoga would be useful for the promotion of positive health and “Quality of Life”. However, there have been no systematic trials evaluating the beneficial effects of Yoga and physical exercise. Hence the present trial was planned using a randomized control design to evaluate the effects of Yoga and physical exercise.

There are many published studies that have devised similar inventories, with *inter-guna* correlations that indicate differentiation of the three modes (Uma K, Lakshmi YS, Parameswaran EG, 1971, Singh R, 1971, Rao PVK. Harigopal K, 1979, Mohan V, Sandhu S, 1986, Mohan V, Sandhu S. 1988). Occupational stress, organizational commitment, job involvement, and job satisfaction in *Sattva, Rajas, and Tamas* types have been studied (Daftuar CN, Anjali, 1997, Sharma R. 1999), In yet another study the Pathak NS, Bhatt ID, Sharma R, 1992, Marutham P, Balodhi JP, Mishra H, 1998) relationship between Maslow’s need hierarchy theory of motivation and the tridimensional personality model was explored (Daftuar CN, Sharma R, 1998). Thus

rather than the theory remaining an esoteric concept its validity and its applicability are being widely tested and issues of using it for measurement are being pursued.

CHAPTER 4

EXPERIMENTAL RESEARCH

In this experimental research the changes in quality of life indicators in normal persons receiving two interventions (Yoga and Physical Exercise) have been evaluated and described. The aim of the study was to evaluate the efficacy of yoga on quality of life after the intervention through a randomized control trial.

4.1 SUBJECTS

4.1.1 Source of subjects

1226 subjects attended introductory lectures that were arranged in different parts of Bangalore City in colleges, health clubs Rotary Clubs, Lion's Clubs and big apartment complexes. 226 subjects in the age range of 18 to 71 years who satisfied the inclusion and exclusion criteria were selected for the study. The participants were randomly allocated to Yoga and physical exercise groups.

Informed Consent:

All 226 participants expressed their willingness to participate in the trial and signed the informed consent. The study was approved by the institutional review board and the ethical committee.

4.1.2 Inclusion criteria

The subjects who had the following attributes were included in the study (a) Healthy individuals of both sexes and between ages 18 – 71 years. (b) Ability to read and write English because the participant had to fill up the questionnaires available in English language.

4.1.3 Exclusion criteria

Subjects with the following conditions were excluded from the trial: (a) those with diseases such as diabetes, cancer, hypertension, anxiety, depression etc., (b) substance abuse, and (c) active nicotine abuse.

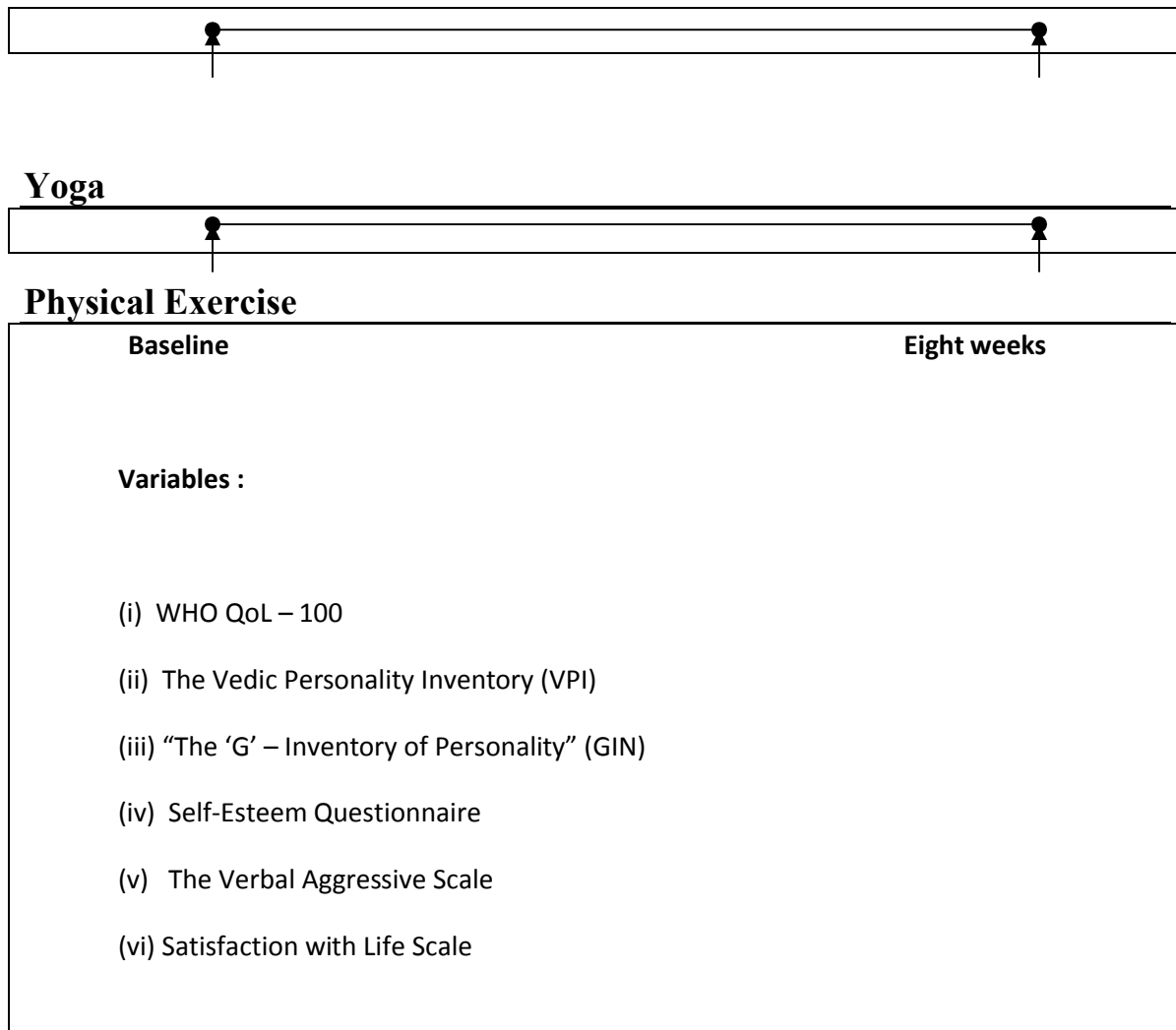
4.1.4 Randomization

After going through the instructions in the informed consent form about the design of the study, 226 subjects agreed to be in the assigned group. These subjects who were willing to participate in the trial and satisfied the inclusion and exclusion criteria were randomly allotted into two groups by using five different random number tables (different table for each centre) generated from the random number generator programme (Zar, 1999) by the statistician who was not interacting with patients. Numbered containers were used to implement the random allocation to conceal the sequence until interventions were assigned.

4.2 Design of the study

This was a prospective randomized two arm wait list control design. Subjects were assessed at baseline and after eight weeks of their respective interventions (Yoga and Physical Exercise). See Fig. 4.2.

Fig. 4.2 - Schematic representation of the design.



4.3 VARIABLES STUDIED (Psychological)

The two groups were assessed at baseline, and after eight weeks of their respective interventions. In the present study the following questionnaires were used to assess the quality of life, *Guna* and Self-esteem.

1. WHO QoL – 100.
2. Vedic Personality Inventory (VPI).
3. ‘G’ – Inventory of Personality” (GIN)

4. Self-Esteem Questionnaire.
5. Verbal Aggressive Scale
6. Satisfaction with Life Scale

The details about the rationale for using individual variables, their usefulness and limitations are given in Appendix 14. The variables studied at baseline and after eight weeks are schematically represented in Fig. 4.2.

It should be noted that in this thesis, the words 'variable' and 'parameter' have been used synonymously. Since parameters are described as 'characteristics of distribution or relationships in the population which are estimated by statistical analysis of a sample of observations', and variables as 'measurements or attributes on which observations are made (Altman, Gore, Gardner, & Pocock, 1983) as far as possible the correct term has been used.

4.3.1 World Health Organisation "Quality of Life (WHO QoL – 100) – World Health Organisation (WHO) with the aid of 15 collaborating centers around the world, has developed two instruments for measuring "Quality of Life", the WHOQOL – 100 and WHOQOL – BREF which could be used in a variety of cultural settings, whilst, allowing the results from different populations and countries to be compared. WHOQoL-100 is a 100 item self-administered instrument consisting of six domains: Global Health, Physical, Psychological, Independence, Social relationships, Environment and Spiritual.

These domains contain 24 facets of four items each, making 96 items in total. One additional facet (4 items) pertains to global QoL and general health. A facet is defined as behavior, state of being and a capacity for potential, subjective perception or experience (WHOQOL instruments). A 5-point response scale is used to rate the intensity, frequency, capacity or evaluation of the selected areas of QoL. The WHOQoL-100 provides separate facet and domain scores, including a score for the facet pertaining to global QoL and

general health. Currently there is no procedure for combining the domain scores into a QoL index. A high score on any of the WHOQoL-100 domains corresponds to a favorable QoL. The WHOQoL-100 was designed for self-administration, but can be interviewer-administered if necessary. The WHOQoL Group suggests that self-administration time for ‘well’ people who are literate in the relevant language is between 20-30 minutes, while interviewer-administration requires 40-90 minutes. Since each facet comprises four items, all facet scores range from 4 – 20, with a possible score range of 16. WHOQOL-100 questionnaire has acceptable psychometric properties for all the 15 centers studied. It has good internal consistency with Cronbach’s alpha ranging from 0.65 (for physical environment) to 0.93 (for working capacity). In terms of discriminant validity all but one facet showed significant differences in mean scores for “well” and “sick” samples (The WHOQOL Group (1998).

4.3.2 The Vedic Personality Inventory (VPI) – The VPI developed by Wolf DB in the year 1998 is a “psychological construct” to assess the scores for the three personality patterns based on the description in the most ancient Indian scriptures called Vedas and hence named VPI. It measures the three Gunas namely *Sattva*, *Rajas* and *Tamas* and has acceptable psychometric properties. It has 90 items comprising 30 for *sattva guṇa*, 28 for *rajo guṇa* and 32 for *tamo guṇa*. The questionnaire can be self-administered and the time taken is around 30 minutes. A seven–point Likert-type scale was chosen as a balance between convenience for the participant and researcher, and statistical power. Still, to minimize chances of spurious outcomes, especially in factor analyses, a seven-point scale was chosen over a five-point scale. Scores for the *guṇas* were obtained by adding the responses for the items for a *guna* and then dividing by the number of items for that mode. For each subscale, a higher score indicates greater predominance of that mode. VPI has good internal consistency and reliability with Cronbach’s alpha ranging from 0.850

for *Sattva* 0.915 for *Rajas* and 0.699 for *Tamas*. In terms of discriminant validity all but one facet had significant differences.(Wolf DB, 1998). The VPI, in its present form, is primarily a tool to assess validity of the *guṇas*, as they are described in Vedic literature, as psychological constructs. With some refinement based on cross-sectional studies across occupation and psychological type, the VPI may be employed in vocational counseling and social service and mental health fields.

4.3.3 “The ‘G’-Inventory of Personality” (GIN) – The GIN inventory is based on the concept of *Guṇās* (personality) from Bhagavadgita, a traditional text of yoga and was developed by Das in 1991. This measure of the three Gunas contains 10 questions that have 3 response choices. The scoring of the questionnaires was carried out as per the instructions in the manuals. The structures of these questionnaires are described below. This has 10 questions to evaluate *Tamas*, *Rajas* & *Sattva guṇās*. The table 4.3.3 shows the *guṇās* -based distribution of the items of the inventory. Each question has 3 answers namely *Sattva*, *Rajas* and *Tamas*. Which question has which answer is given in the table? The questionnaire is given in the Appendix.

Table 4.3.3 Guna-based distribution of the items of the inventory.

| Individuals items indicating | A | B | C | D | E | F | G | H | I | J |
|------------------------------|---|---|---|---|---|---|---|---|---|---|
| <i>Sattva</i> | A | c | a | c | b | a | a | b | b | b |
| <i>Rajas</i> | B | c | c | a | a | b | c | c | c | b |
| <i>Tamas</i> | C | b | b | b | c | c | b | a | a | c |

The score value of weightage of an item indicating *Sattva* is 3, for an item indicating *Rajas* is 2, and for an item indicating *Tamas* is 1. It classifies people as being predominantly of

Sattva, *Rajas* or *Tamas* type depending on their total score on the test. The relation between the *Guṇā* type and score is summarized below:

| | | | |
|------------------|--------------|--------------|---------------|
| Score | < 24 | 24-28 | >28 |
| <i>Guṇā</i> Type | <i>Tamas</i> | <i>Rajas</i> | <i>Sattva</i> |

It can be self-administered and the time taken will be around 5 minutes. The coefficient of correlation of 0.60 between the test and the retest scores being significant at 0.01 level of confidence that the Inventory has a high degree of reliability. The normal distribution of the score is around 25.91. This test has a test-retest of 0.60 with a confidence level of 99% and has been validated. This is a valid tool for identifying the personality. The inventory was very useful in analyzing the three personality traits in the society.

4.3.4 Self-esteem Questionnaire (SEQ) - This multidimensional questionnaire developed and standardized by S.K. Karunanidhi (1996). This questionnaire is designed to evaluate Self-esteem. The multi-dimensional self-esteem questionnaire consisted of 83 items in the form of statements. It has both positive and negative items. Categories are well mixed to reduce the halo effect and the logical error, and double-barreled statements are avoided. Each statement has four alternative responses such as ‘Always’, ‘Most of the time’, ‘Sometimes’ and ‘Never’.

The inventory measures six dimensions of self-esteem: Competency (16 items), Global self-esteem (16 items), Moral and self Control (13 items), Social-esteem (12 items), Family (11 items) and Body and Physical Appearance (9 items). It is a self-administration questionnaire.

Table 4.3.4. The scoring key for Self –Esteem Questionnaire

| Dimensions of self-esteem | Question Nos. | Maximum possible score |
|---------------------------|---------------|------------------------|
| | | |

| | | |
|------------------------------|--|----|
| Competency | 1,8*, 15, 22, 29*, 36, 43, 49, 55, 61, 66*, 71, 75, 78, 80 and 82. | 64 |
| Global self-esteem | 2, 9, 16*, 23*, 30, 37, 44*, 50, 56, 62, 67*, 72, 76*, 79*, 81* and 83 | 64 |
| Moral and Self-control | 3, 10*, 17, 24, 31*, 38, 45, 51, 57*, 63*, 68*, 73*, 77. | 52 |
| Social esteem scale | 4, 11, 18*, 25, 32*, 39*, 46, 52*, 58, 64*, 69* and 74 | 48 |
| Family scale | 12*, 19, 26, 33*, 40*, 47*, 53, 59*, 65 and 70 | 44 |
| Body and Physical appearance | 6, 13, 20*, 27*, 34, 41*, 48, 54 and 60*. | 36 |
| Lie Scale | 7, 14, 21, 28*, 35 and 42 | 24 |

- Indicates reverse scoring procedure.

| | Reverse score (*) | Remaining items |
|--------------------|-------------------|-----------------|
| 'Always | 1 | 4 |
| 'Most of the time' | 2 | 3 |
| 'Sometimes' | 3 | 2 |
| 'Never' | 4 | 1 |

Higher the score in each dimension the level of self-esteem is high. If the individual obtained maximum scored of 24 in Lie Scale, it is considered as invalid for analysis. It has acceptable psychometric properties with good internal consistency, reliability and validity.

These questions are to help more about how boys and girls feel about different things. This questionnaire helps to assess the perception of the level of self-esteem about the subjects in different areas.

4.3.5 The Verbal Aggressiveness Scale (VAS) – The VAS is an interpersonal model and measure was developed by Infante DA, Wigley CJ. in the year 1986 contains 20 items scored on a 5-point linear rating format with reverse scoring on ten out of 20 items (questions- 1,3,5,8,10,12,14,15,17,20). The Scores can range from 20 to 100. The VAS gives a single overall score that describes the disposition of an individual towards low, moderate or high verbal aggressiveness. Scores from 20-46 suggests low verbal aggressiveness, 47-73 suggests moderate verbal aggressiveness and 74-100 suggests high verbal aggressiveness.

This Scale is stable across time. The reported test-retest reliability is 0.82 for a 4-week period. Further the cross-culture reliability has been supported in a number of studies (Infante DA, Wigley CJ, 1986).

4.3.6 Satisfaction with Life Scale (SWLS) - The Satisfaction with Life Scale (SWLS) is a short, 5-item instrument designed to measure the global judgment of life satisfaction, which is theoretically predicted to depend on a comparison of life circumstances to one's standards. The SWLS has been examined for both reliability and sensitivity. Scores on the SWLS can be interpreted in terms of absolute as well as relative life satisfaction. A score of 20 represents the neutral point on the scale, the point at which the respondent is about equally satisfied and dissatisfied. The scores 5-9 represents extremely dissatisfied, 10-14 moderately dissatisfied, 15-19 slightly dissatisfied, 20 neutral, 21-25 slightly satisfied, 26-30 satisfied and 31-35 extremely satisfied. The SWLS has shown strong internal reliability and moderate temporal stability. Diener et al (1985) reported a coefficient alpha of 0.87 for the scale and a 2-month test-retest stability coefficient alpha of 0.82. Since that time, a number of other investigators have reported both

internal consistency and temporal reliability data for the scale. The scale usually requires only about one minute of respondent time.

In the present study, the test was self - administered by encouraging the subjects to sit in a quiet place free from distractions and influences from other people.

The answers were recorded on a separate sheet for each subject. Since the questionnaire was already evaluated for reliability and validity for the standardized English version of the questionnaire was administered in the present study.

All the above questionnaires have been given in the Appendix

4.4 DATA EXTRACTJION

4.4.1 WHO QoL – 100 - The scoring of the questionnaires was carried out as per the instructions in the manual and under the guidance of a psychologist. A 5-point response scale is used to rate the intensity, frequency, capacity or evaluation of the selected areas of QoL. The WHO QoL-100 provides separate facet and domain scores, including a score for the facet pertaining to global health and general health. A high score on any of the domains (highest possible is 20) corresponds to a favourable QoL.

Table 4.1.1 - Domains and facets of the WHOQoL-100

| Domain | Facet |
|---------------------------|--|
| I Physical health | 1 Pain and discomfort 2 Energy and fatigue 3 Sleep and rest |
| II Psychological health | 4 Positive affect 5 Thinking, learning, memory and concentration 6 Self-esteem 7 Body image and appearance 8 Negative affect |
| III Level of independence | 9 Mobility 10 Activities of daily living 11 Dependence on medication or treatments 12 Working capacity |

| | |
|-------------------------|---|
| IV Social relationships | 13 Personal relationships 14 Social support 15 Sexual activity |
| V Environment | 16 Physical safety and security 17 Home environment 18 Financial resources 19 Health and social care: accessibility and quality 20 Opportunities for acquiring new information and skills 21 Participation in and opportunities for recreation/leisure activities 22 Physical environment (pollution, noise, traffic, climate) 23 Transportation |
| VI Spiritual domain | 24. Spirituality/religion/personal beliefs |
| VII Additional | 25. Overall Quality of life and general health |

4.4.2 The Vedic Personality Inventory – A 7-point Likert-type scale is chosen as a balance between convenience for the participant and researcher, and statistical power. The VPI is used to evaluate *Sattva*, *Rajas* and *Tamas* *guṇas*. Scores for the *guṇas* are obtained by adding the responses for the items for a *guna* and then dividing by the number of items for that mode. For each of the 3 subscales, (*Sattva*, *Rajas* and *Tamas*) a higher score indicates greater predominance of that mode.

4.4.3 “The ‘G’ Inventory of Personality” - This has 10 questions to evaluate *Tamas*, *Rajas* & *Sattva* *guṇas*. The score value of weightage of an item indicating *Sattva* is 3, for an item indicating *Rajas* is 2, and for an item indicating *Tamas* is 1. It classifies people as being predominantly of *Sattva*, *Rajas* or *Tamas* type depending on their total score on the test. The relation between the *guṇā* type and score is summarized below:

| | | | |
|-------|------|-------|-----|
| Score | < 24 | 24-28 | >28 |
|-------|------|-------|-----|

4.4.4 Self-esteem Questionnaire – This multi-dimensional self-esteem questionnaire has 83 items with seven sub scales in the form of statements with both positive and negative items. 32 items have negative scoring. Assessment is done on a 4-point scale to evaluate competency, global self-esteem, Moral and self-esteem, social esteem, family self-esteem, body and physical appearance and lie scale. A higher score indicates greater predominance of that mode.

4.4.5 The Verbal Aggressive Scale (VAS) - VAS is an interpersonal model and measure. The VAS developed by Infante and Wigley contains 20 items scored on a 5-point linear rating format with reverse scoring on ten out of 20 items (questions-1,3,5,8,10,12,14,15,17,20). The Scores can range from 20 to 100. The VAS gives a single overall score that describes the disposition of an individual towards low, moderate or high verbal aggressiveness. Scores from 20-46 suggests low verbal aggressiveness, 47-73 suggests moderate verbal aggressiveness and 74-100 suggests high verbal aggressiveness.

4.4.6 The Satisfaction with Life Scale (SWLS) - is a short, 5-item instrument designed to measure the global judgment of life satisfaction, which is theoretically predicted to depend on a comparison of life circumstances to one's standards. Scores on the SWLS can be interpreted in terms of absolute as well as relative life satisfaction. A score of 20 represents the neutral point on the scale, the point at which the respondent is about equally satisfied and dissatisfied. The scores 5-9 represents extremely dissatisfied, 10-14 moderately dissatisfied, 15-19 slightly dissatisfied, 20 neutral, 21-25 slightly satisfied, 26-30 satisfied and 31-35 extremely satisfied.

4.5 DATA ANALYSIS

Data were analyzed using the statistical package (SPSS Version 10.0). The data of baseline of the two groups were assessed with tests for normality using both graphical presentations (box plot and histogram) as well as Kolmogorov-Smirnov test.

Wherever the data was normal, parametric tests such as Independent samples test, repeated measures ANOVA were used to compare the means between the groups. Paired tests were used to analyse the data within the groups. Where the data were not normally

distributed we used non parametric tests i.e., Manwhitney test to compare the data between groups, Wilcoxon paired signed ranks test for pre post change within groups. When the data were binary (i.e., '0' or '1'), i.e., McNemar non-parametric statistical test was used to compare data at base line both those after 8 weeks within the group.

4.6 INTERVENTIONS

4.6.1 Yoga training - The Yoga session was planned to include: physical activity, relaxation, regulated breathing and philosophical aspects of yoga. This was an integrated approach of yoga, derived from principles in ancient yoga texts that emphasize that yoga should promote health at all levels (Gambhirananda, 2002). This combination is believed to promote physical health (Asanas (physical postures), *Kriyās*, healthy yoga diet loosening exercises and relaxation techniques), normal functioning at the subtle energy level (breathing exercises, Prāṇāyama (voluntarily regulated breathing)), mental and emotional level (meditation and devotional sessions) and at the intellectual level (lectures on philosophy of Yoga). The Integrated yoga module was selected from the integrated set of yoga practices used in earlier studies on yoga for positive health. (Nagendra & Nagarathna, 1985).

Promotion of physical health by loosening exercises, *Āsanas* (physical postures), relaxation techniques, *Kriyās* and healthy yoga diet.

4.6.1.1 Physical exercises and Movements - *Çithalékaraëa Vyäyāma* – Very simple physical movements to mobilise and activate the affected parts of the body. It looses the joints, stretch and relax the muscles , improve the power and develop stamina.

4.6.1.2 *Āsanas* – Asana is the first part of hatha yoga. *Āsana* is a specific position which opens the energy channels and psychic centres. *Āsana* helps to develop steadiness of

body and mind, diseaselessness and lightness (flexibility) of the limbs. The body also becomes supple. It evokes the dormant

potentiality in man. It helps raise man from his animal nature to normalcy and raise him further up the steps to achieve the goal of total freedom. Flexibility of spine is taken care of and aims for positive health and overall personality development will take place.

4.6.1.2A Standing Āsanās

Ardha cakrāsana – Makes the spine flexible, stimulates the spinal nerves, promotes circulation of blood into head. Strengthens the neck muscles. Expands chest and shoulders. Improves breathing.

Pāda hastāsana – Makes the spine flexible, strengthens the thighs. Helps preventing constipation and menstrual problems. Improves digestion. Enhances blood flow to the head region.

Parivṛtta trikoṇāsana – Gives rotational movements to the spine. Improves the functioning of kidneys and strengthens the thigh muscles.

4.6.1.2B Sitting Āsanās

Vajrāsana, Supta Vajrāsana – One of the meditative postures. Keeps the spine erect and prevents drowsiness. Stimulates Vajra nādi at the ankles which increases awareness. Helps in cases of Varicose veins. Prevents deep veins thrombosis. Makes the ankles

flexible and prevents flat foot. The only posture which can be performed even after heavy food. Useful for heel pain.

Śaśāṅkāsana – Enhances blood flow to the head, stimulates the brain, gives flexibility to the spine, ankles and knees. A good posture for breathing ailments.

Hamsāsana or *Mayūrāsana* – Makes the wrists flexible and the arms stronger. Improves digestion. Helps to clear constipation. Activates the pancreas. Beneficial for poor appetite, irritable bowel. Tones up abdomen, reduces fat on tummy, strengthens the forearms, wrists and elbows. Prevents accumulation of gases. Vitalizes the endocrines in the abdomen. Very good for diabetes.

Ardha śīrśāsana or *Śīrśāsana* - Due to improved circulation to the brain, the whole nervous system becomes healthy. Memory improves. Endocrine glands such as the pituitary and the thyroid get revitalised. Helpful in hernia. Seminal weakness can be cured. Improves concentration power remarkably.

4.6.1.2C Prone Āsanās

Dhanurāsana – Useful for diabetes patients. Removes gastro intestinal disorders, stimulates and helps in slimming the whole body. Gives good stimulation and flexibility to the back.

4.6.1.2D Supine Āsanās

Sarvāṅgāsana - Stimulates and keeps the thyroid healthy. Influences the pelvic organs. Useful in varicose veins, piles, hernia and menstrual disorders.

Matyāsasana - Complementary to Sarvāṅgāsana, good for diabetes, asthamatics and other respiratory problems.

4.6.1.3 Deep Relaxation Technique – This practice is useful for developing body and mind awareness. Its effects influence the physical as well as the psychological structure. It is very useful in yogic management of high blood pressure, peptic ulcer, anxiety, hysteria, cancer and all psychosomatic diseases and neuroses. It helps to bring up the latent impressions buried within the subconscious mind.

4.6.1.4 Kriyās - Cleanses the internal passages and builds up stamina on the basis of progressively increasing stimuli followed by rest; the background of progressively increasing relaxation and rest by other practices on a daily basis is essential. *Kriyās* activates and revitalizes the organs. Toning up their functions. Desensitization and development of deep internal awareness.

Jalaneti – It helps to clear nasal passages. Removes cold, hypersensitivity, headache, sinusitis, bronchitis and stimulates olfactory nerves.

Vamana Dhauti – It helps to remove hyper acidity, good for flatulence and dyspepsia (indigestion), cleanses the stomach of all its contents, promotes proper functioning of the stomach and prevents hyper acidity. It is very useful for gas trouble, and for curing Asthma and bronchitis to clear the air passages through reflex stimulation of *Udāna Prāna*.

Kapālabhāti – *Kapālabhāti* is fine kriya which stimulates all-round activity throughout the body. The abdominal muscles are vigorously exercised to bring about flexibility and massaging of the abdominal organs. It washes away carbon dioxide from the lungs and increased oxygen concentration in the lungs. Increased heart rate pumps the blood throughout the system so that lethargy of the cells is eliminated due to sedentary

habits. Both exocrine glands gets stimulated. There is a marked improvement in the digestive process . The brain cells are invigorated continuously thereby revitalises the functions of the brains. Memory cells and many other cells in the brain are brought into action. It is beneficial for patients with diabetes, obesity, respiratory disorders, digestive problems etc.,

4.6.1.5 Healthy diet – The yogic concept of food takes into consideration the total dimension of human existence. Apart from the atoms and molecules with which our gross physical body is made of, we all possess Prāna, Mind, Intellect, Emotions and the Spiritual Dimension featured by Freedom. Yoga is that process by which we bring an integration of the entire personality at all these levels. The stamina of the body is to be developed, the Prāna should be brought to a nice balance, the mind should be calmed down, the emotion should be stabilized and the intellect should be under total control. A ‘Balanced Diet’, therefore, according to Yoga, is that diet which restores balance at all levels. Only such diets could aid in a Holistic Way of Living.

4.6.1.6 Breathing Practices – The objectives of the breathing practices are

1. Bringing into action all the lobes of the lungs for full utilization.
2. To normalize the breathing rate and
3. To make the breathing uniform, continuous and rhythmic.

4.6.1.7 Prāṇāyāma - *Prāṇāyāma* brings mastery over *Prāṇā*.

Vibhāgīya svaśana – It brings more power and vitality.

Calmness in daily activities. Thinking and clarity of thought improve.

B Nāḍīsuddhi Prāṇāyama – It promotes balance between the two nostrils apart from cleansing the nasal tract. It increases the vitality. Metabolic rate decreases. It increases the digestive fire and appetite. It lowers the levels of stress and anxiety by harmonising the prānas. It is beneficial in respiratory disorders such as Bronchial asthma, Nasal allergy, Bronchitis etc., It induces tranquility, clarity of thought and concentration. It clears prānic blockages and balances Ida and Pingala nādis, causing Śuṣumna nāḍi to flow which leads to deep states of meditation and spiritual awakening. It helps to maintain Brahmacharya which is a pre-requisite for spiritual progress.

Śitalī Prāṇāyama, Sītkāri Prāṇāyama, Sadanta Prāṇāyama – They induce muscular relaxation and an over-all cooling effect. They soothe the eyes, ears and purify the blood. They quench the thirst, appease hunger and generate a feeling of satisfaction. The taste buds and the mouth are sensitised. Allergies due to cold can be effectively overcome by

prolonged practice. They help in reducing tensions and stresses and induce mental tranquility. *Sītkāri, Sadanta* keep the teeth and gums healthy. They help reduce blood pressure and acidity in stomach. They cure chronic dyspepsia (indigestion), various chronic skin diseases and releases even very subtle tensions.

Expansion of awareness – a facet of spiritual growth takes place as you move from *Śitalī* (linear awareness) *Sītkāri* to (surface awareness) and then to *Sadanta* (3-D awareness).

Bhrāmarī Prāṇāyama- Creates a soothing effect on the nervous system. Cultures the voice and increases the melody. Relieves stress and cerebral tension. Reduces anger, anxiety, insomnia and blood pressure. Good for all psychosomatic problems as it reduces the stresses and tension. Eliminates throat ailments (tonsils, pains etc.,). Speeds up healing of tissue and so may be practised after surgery. Develop the 3-D awareness. It aids in expansion of the mind towards all pervasive awareness. It induces a meditative state by harmonising the mind and directing the awareness inwards.

Nādānusandhāna – It brings resonance all over the body. The resonant sounds act as stimulations and the post-resonance silence deepens the awareness and releases even very subtle tensions.

4.6.1.8 Meditation - Om meditation– Meditation is a Yogic process of providing deep rest to the system by allowing the mind to calm down to its basal states. It gives deep relaxation to all parts of the body, reduces metabolic rate, freshness, lightness and a feeling of expansion at mental level. It gives calmness, peace and serene bliss and continuous awareness. It improves concentration, memory, emotional equipoise and higher creativity.

4.6.1.9 Bhajans – Bhajans help to culture the emotions by harnessing the “Right Brain”, purifies the emotions and elevates man to experience ecstatic bliss of Divinity. Heart becomes light and the gloom of unknown sorrow changes into a bright gleam of joy.

4.6.1.10 Notional correction

- A. Lectures – Series of 12 lectures on Integrated Approach of Yoga Therapy to unravel the concept of health according to WHO definition and its relation to Yoga; concept of body and disease according to modern medical science and yoga; happiness analysis; bhakti yoga and karma yoga
- B. Yoga Counselling – Having given the overall vision about Yoga, Health and IAYT for promotion of positive health through lectures interactions, questions and answers, yoga counselling at individual level was used to concretise this wisdom and solve their psychological problems that may be contributing to their day to day hassles and stresses. Qualified yoga teachers taught yoga.

Table 4.6.1 gives the details of the practices.

Appendix 15 gives the pictures and instructions for practice.

Table 4.6.1 Details of the practices

| Sl. No. | Duration | Names | Benefits |
|---------|-----------|--|--|
| 1 | 5 minutes | Breathing practices Hands in and out breathing Dog breathing Tiger breathing Straight legs raise breathing (alt. Both) | 1. Brings into action all the lobes of the lungs for full utilization. 2. Normalizes the breathing rate 3. Makes the breathing uniform, continuous and rhythmic. |
| 2 | 5 minutes | Loosening Exercises Jogging Forward and backward bending Side bending | 1. Prepares the joints for better flexibility to move on to postures |

Twisting

Pavanamuktāsana kriya

3 25 minutes *Āsanas*

Standing

Ardha cakrāsana

Pāda hastāsana

Sitting

Vajrāsana

Supta vajrāsana

Śasānkāsana

Hamsāsana or Mayūrāsana

Prone postures

Dhanurāsana

Supine postures

Sarvāṅgāsana

Matyāsana

Ardha śīrśāsana or Śīrśāsana

1. Balance and harmony
2. Great speed in movement due to agility
3. Flexible body.
4. Supple but stone hard when the need arises
5. Relaxation in action and hence conservation of energy.
6. Tranquility of mind and clarity of thought

4 5 minutes Deep Relaxation Technique

1. Deep rest to cells
2. Stress reduction
3. Rejuvenates the tissues
4. Unfolds the latent impressions buried within the subconscious mind.

| | | | |
|---|------------|--|--|
| 5 | 10 minutes | <i>Prāṇāyāma</i> <i>Vibhāgīya svaśa</i> <i>Nāḍīsuddhi prāṇāyama</i> <i>Śitalī, Sītkāri, Sadanta Prāṇāyama</i> <i>Bhrāmarī Prāṇāyama</i> <i>Nādānusandhāna</i> OR | Brings mastery over <i>Prāṇāyama</i> . |
| 6 | | Meditation – Om Meditation | <ol style="list-style-type: none"> 1. Provides deep rest to the system. 2. calms down the mind 3. Reduces metabolic rate, 4. blissful awareness 5. freshness, lightness 6. expansion at mental level.. 7. emotional equipoise 8. improves concentration, memory, and creativity. |
| 7 | 10 minutes | Bhajans Lectures | <ol style="list-style-type: none"> 1. Cultures the emotions. 2. Removes ignorance and wrong notions. 3. Stable personality. |
| 8 | | <i>Kriyas</i> <i>Trataka</i> <i>Kapālabhāti</i> | <ol style="list-style-type: none"> 1. Cleanses the body removes the toxins. 2. It desensitizes the possible hyper sensitivity. |

4.7 Physical Exercise training - The set of physical exercises were the standard practices (Nagendra & Nagarathna, 2001) to provide mild to moderate exercises designed by experts in physical education and taught by trained physical education teachers.

Also, the present study evaluated different dimensions of quality of life. These range from general health measures to psychological variables. Hence the diverse Yoga

practices were expected to be influencing different aspects of functioning. As the program was an integrated one, the cumulative effects were considered interesting.

4.7.1 Warm up Exercises – The warm up exercises helps to improve flexibility and elasticity.

(a) Loosening of ankles (b) knee caps, (c) waist, (d) spine (e) twisting, (f) shoulder movements, (g) hands movement, (h) wrist movement and rotation, (i) neck movement and rotation, (j) head movements and rotations.

4.7.2 Stretches – Stretches helps to stretch and relax the muscles.

(a) leg stretch, (b) hand stretch, (c) leg to hand, (d) sideward leg stretch (full), (e) folded leg lumber stretch, (g) dog stretch, (i) tiger stretch, (j) dorsal stretch.

4.7.3 Sit-ups (50 to 100 times), Push-ups (20 times), Squats –helps to improve the stamina.

4.7.4 Supine – (a) Single leg raising, (b) alternative leg raising, (c) both leg raising (50times) (d)coming up and touching the knees to forehead and going back.(e) cycling,

4.7.5 Dynamics – Dynamics helps to remove lethargy and tardiness in the body. Develop the stamina of the body. Discipline the body-mind complex.

(a) forward Backward bending, (b) side bending, (c) bending & twisting (Simple and legs apart), (d) Twisting.

4.7.6 Lectures included Importance of PE, Food, Counseling and health education etc. – Lectures helps to correct the wrong notions helps to follow the right path.

Table 4.7 Details of the practices

| Sl. No. | Duration | Names | Benefits |
|---------|----------|---|--|
| 1 | 10 | Warm up Exercises (a) loosening of ankles (b) knee caps, | The warm up exercises helps to improve |

| | | | |
|---|----|--|--|
| | | (c) waist, | Flexibility and elasticity. |
| | | (d) spine | |
| | | (e) twisting, | |
| | | (f) shoulder movements, | |
| | | (g) hands movement, | |
| | | (h) wrist movement and rotation, | |
| | | (i) neck movement and rotation, | |
| | | (j) head movements and rotations. | |
| 2 | 10 | Stretches | Stretch and relax the muscles. |
| | | (a) leg stretch, | |
| | | (b) hand stretch, | |
| | | (c) leg to hand, | |
| | | (d) sideward | |
| | | (e) leg stretch (full), | |
| | | (f) folded leg lumber stretch, | |
| | | (g) dog stretch, | |
| | | (h) tiger stretch, | |
| | | (i) dorsal stretch. | |
| | | Sit-ups (50 to 100 times), | Improves strength and stamina |
| 3 | 10 | Push-ups (20 times), | |
| | | Butterfly practices | |
| | | Supine | Stamina building |
| 4 | 10 | (a) single leg raising, | |
| | | (b) alternative leg raising, | |
| | | (c) both leg raising (50times) | |
| | | (d) coming up and touching the knees to forehead and going back. | |
| | | (e) Cycling. | |
| | | Dynamics | Dynamics help to remove lethargy and tardiness in the body. Develop the stamina of the body. Discipline the body-mind complex. |
| 5 | 10 | (a) forward Backward bending, | |
| | | (b) side bending, | |

| | | | |
|---|----|--|--|
| | | (c) bending & twisting (Simple and legs apart), (d) Twisting. | |
| 6 | 10 | Lectures included Importance of PE, Food, Counseling And health education etc., | Corrects the wrong notions helps to follow right path. |

Treatment Fidelity - The Yoga was practiced in a group. The intervention leader was a trained yoga instructor who had no other part in the trial. The yoga instructor monitored the attendance for the sessions, as well as the correctness of their practice and their involvement in it. The Physical Exercise group was also given mild to moderate physical exercise practice by a trained instructor in another room. Their participation in the program was monitored.

5. RESULTS – WHO QoL - 100

Figure 1 shows the trial profile. Of the 1326 subjects who attended the motivational lectures, 236 who satisfied the inclusion and exclusion criteria were selected and randomly allotted to Y and PE groups. The reasons for 42 subjects drop out are change of address, unexpected duty shifts, weather conditions, out of station, ill health and wanted to shift to Yoga. The data was recorded for WHO QoL – 100 in both the groups at baseline and after eight weeks.

5.1 DEMOGRAPHY

5.1.1 Demography: Table 5.1.1 shows the demographic data. There were 92 females and 92 males within the age range of 18 – 71 years. The mean age was 29.99±12.30. They belonged to different callings. There were 85 college students, 50 employees, 29 housewives, 11 business people and 9 professionals. The subjects were selected from 5 different areas of Bangalore (North, South, East, West and Central). The details of the number of in each centre are shown in the table.

Table 5.1.1 - Demographic Data of subjects

| | Yoga | P.E |
|-------------------------|--------------|--------------|
| No. of participants (n) | 92 | 92 |
| 1.Age (years) | 29.73(12.38) | 30.26(12.29) |
| Range | 18 to 71 | 18 to 60 |
| 2.Gender | | |
| Females | 42 | 39 |
| Males | 50 | 53 |
| 3.Category | | |

| | | |
|---------------|----|----|
| Students | 45 | 40 |
| Employees | 20 | 30 |
| Housewives | 10 | 19 |
| Business | 8 | 3 |
| Professionals | 9 | |

4. No. in different centers

| | | |
|----------------------|----|----|
| (a) Center 1- Centre | 33 | 33 |
| (b) Center 2 – West | 15 | 15 |
| (c) Center 3 – East | 25 | 25 |
| (d) Center 4 – South | 24 | 24 |
| (e) Center 5 – North | 16 | 16 |

5.1.2 – WHO QoL– Domain 1 - Global Health (GH) – Global Health contains 4 questions that deal with rating the quality of life.

G1 – How would you rate your Quality of Life?

G2 – How satisfied are you with the Quality of Life?

G3 – In general, how satisfied are you with your life.

G4 – How satisfied are you with your health?

Data at baseline for both the groups were assessed for normal distribution using Kolmogorov Smirnov test. The baseline values were not normally distributed ($p = 0.001$). Mann-Whitney test was done to analyse the data between the groups and Wilcoxon Signed ranks test within the groups.

The pre/post assessment was done and calculated for the Yoga group (Y) and Physical Exercise group (PE).

Table 5.1.2. Mean \pm SD for Global Health

| | | Mean \pm SD | Mean \pm SD | p value | Y-PE Sig |
|---------------------|----|------------------|------------------|---------|----------|
| | | Pre | Post | | |
| | Y | 15.51 \pm 1.95 | 16.36 \pm 1.90 | <0.001* | 0.726 |
| | PE | 15.82 \pm 2.30 | 16.44 \pm 2.10 | 0.020* | |
| Age \leq 24 years | Y | 15.47 \pm 1.85 | 16.71 \pm 2.01 | <0.001* | 0.887 |
| | PE | 16.06 \pm 2.33 | 16.74 \pm 2.40 | 0.159 | |
| Age >24 years | Y | 15.55 \pm 2.11 | 15.89 \pm 1.64 | 0.315 | 0.608 |

| | | | | | |
|---------|----|------------|------------|--------|-------|
| | PE | 15.69±2.36 | 16.28±1.87 | 0.067 | |
| Females | Y | 15.71±2.15 | 16.29±1.97 | 0.126 | 0.914 |
| | PE | 15.74±2.65 | 16.36±2.17 | 0.182 | |
| Males | Y | 15.33±1.78 | 16.42±1.75 | 0.001* | 0.806 |
| | PE | 15.88±2.12 | 16.5±2.03 | 0.054 | |

- *Significant difference within the groups – (Wilcoxon Signed Ranks Test)
- Y – Yoga group, PE – Physical Exercise.
- Both Y & PE groups showed significant difference (Y - $p < 0.01$, PE - $p = 0.020$).

The pre assessment did not show any significant difference between the two groups.

The participants below 24 years showed significant difference ($p < 0.001$) within the Yoga group.

Analysis of the male participants also showed significant difference ($p = 0.001$) within the Yoga group.

The post assessment also indicated that there is no significant difference between the two groups.

5.1.3 WHO QoL 100 Domain 2 - Physical Health (PHY) – Physical Health is a combination of 3 facets namely F1, F2 and F3. F1 - Pain and discomfort, F2 – Energy and fatigue and F3 – Sleep and rest.

Data at baseline for both the groups were assessed for normal distribution using Kolmogorov Smirnov test. The baseline values were not normally distributed ($p = 0.000$). Mann-Whitney test was done to analyse the data between the groups and Wilcoxon Signed ranks test within groups.

Table 5.1.3 Mean \pm SD for Physical Health

| | | Mean \pm SD | Mean \pm SD | p value | Y-PE Sig |
|---------------------|----|------------------|------------------|---------|----------|
| | | Pre | Post | | |
| Age \leq 24 years | Y | 13.73 \pm 1.31 | 13.71 \pm 1.51 | 0.947 | 0.155 |
| | PE | 13.99 \pm 1.17 | 14.02 \pm 1.24 | 0.642 | |
| | Y | 13.44 \pm 1.34 | 13.81 \pm 1.58 | 0.263 | 0.468 |
| | PE | 13.89 \pm 1.14 | 14.02 \pm 1.32 | 0.269 | |
| Age >24 years | Y | 13.93 \pm 1.23 | 13.97 \pm 1.41 | 0.499 | 0.158 |
| | PE | 13.96 \pm 1.49 | 14.45 \pm 1.38 | 0.013* | |
| Females | Y | 13.63 \pm 1.31 | 14.10 \pm 1.45 | 0.039* | 0.215 |
| | PE | 13.85 \pm 1.52 | 14.56 \pm 1.47 | 0.002* | |
| Males | Y | 13.73 \pm 1.31 | 13.71 \pm 1.51 | 0.947 | 0.314 |

| | | | |
|----|------------|------------|-------|
| PE | 13.99±1.17 | 14.02±1.24 | 0.642 |
|----|------------|------------|-------|

- *Significant difference within the groups – (Wilcoxon Signed Ranks Test)
- Y – Yoga group, PE – Physical Exercise.
- Both Y & PE showed no significant difference between and within groups.
- The effect size (Y=0.12, PE =0.22) was more in PE than Y group.

The pre assessment did not show any significant difference between the two groups.

The participants above 24 years showed significant difference ($p < 0.013$) within the Physical Exercise (PE) group.

Analysis of the female participants showed a significant difference in both Yoga ($p = 0.039$) and Physical Exercise ($p = 0.002$) within the groups.

The post assessment also indicated that there is no significant difference between the two groups.

5.1.4 – WHO QoL – 100 Domain 3 – Psychological health (PHY) – Psychological Health is a combination of 5 facets namely F4, F5, F6, F7 and F8. F4 – Positive affect, F5 Thinking, learning, memory and concentration, F6 – Self-esteem, F7 = Body image and appearance and F8 – Negative affect.

Data at baseline for both the groups were assessed for normal distribution using Kolmogorov Smirnov test. The baseline values were not normally distributed ($p < 0.001$). Mann-Whitney test was done to analyse the data between the groups and Wilcoxon Signed ranks test within groups.

Table 5.1.4 Mean \pm SD for Psychological Health

| | | Mean \pm SD | Mean \pm SD | p value | Y – PE Sig |
|---------------------|----|------------------|------------------|---------|------------|
| | | Pre | Post | | |
| Age \leq 24 years | Y | 14.62 \pm 1.51 | 15.30 \pm 1.44 | <0.001* | 0.376 |
| | PE | 14.67 \pm 1.78 | 15.45 \pm 1.60 | <0.001* | |
| | Y | 14.52 \pm 1.58 | 15.34 \pm 1.09 | 0.002* | 0.744 |
| | PE | 14.47 \pm 1.61 | 15.21 \pm 1.50 | 0.004* | |
| Age >24 years | Y | 14.80 \pm 1.54 | 15.32 \pm 1.77 | 0.035* | 0.336 |
| | PE | 14.92 \pm 1.94 | 15.71 \pm 1.67 | 0.001* | |
| Females | Y | 14.48 \pm 1.70 | 15.40 \pm 1.76 | 0.001* | 0.548 |
| | PE | 14.76 \pm 2.25 | 15.61 \pm 1.80 | 0.004* | |
| Males | Y | 14.82 \pm 1.42 | 15.27 \pm 1.16 | 0.039* | 0.565 |

| | | | |
|----|------------|------------|--------|
| PE | 14.66±1.39 | 15.38±1.45 | 0.001* |
|----|------------|------------|--------|

- *Significant difference within the groups – (Wilcoxon Sigend Ranks Test)
- Y – Yoga group, PE – Physical Exercise.
- Effect Size Y – 0.43, PE – 0.52
- Both Y & PE showed significant difference within groups.
- The effect size (Y=0.43, PE =0.52) was more in PE than Y group.
- There was no significant difference between groups.

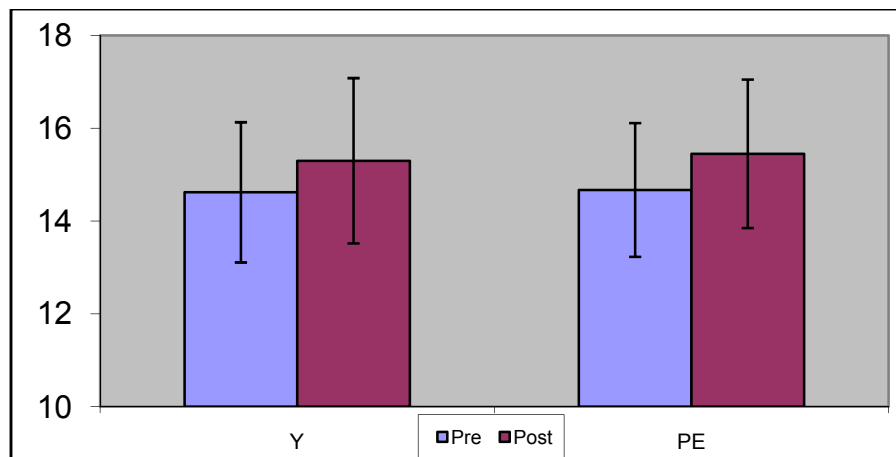
The pre assessment did not show any significant difference between the two groups.

The participants above and below 24 years showed significant difference in both Yoga and Physical Exercise group.

Analysis of the female and male participants showed significant difference in both Yoga (p = 0.039) and Physical Exercise (p=0.002) within the groups.

The post assessment also indicated that there is no significant difference between the two groups.

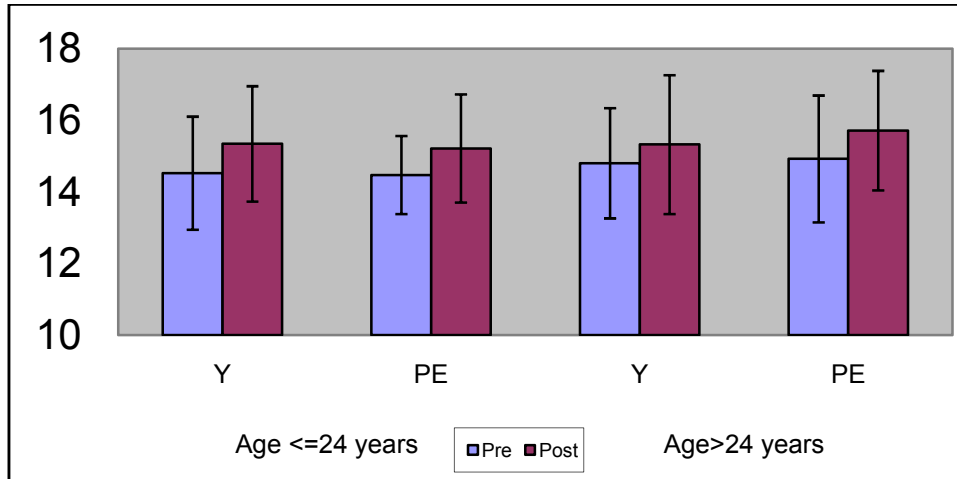
Fig. 5.1.4 Mean ± SD Psychological Health



The pre-post scores on Psychological Health domain of the Yoga group indicated that there is improvement in the psychological health of the participants in the post assessment.

The Physical Exercise group also indicated better physical health in the post assessment.

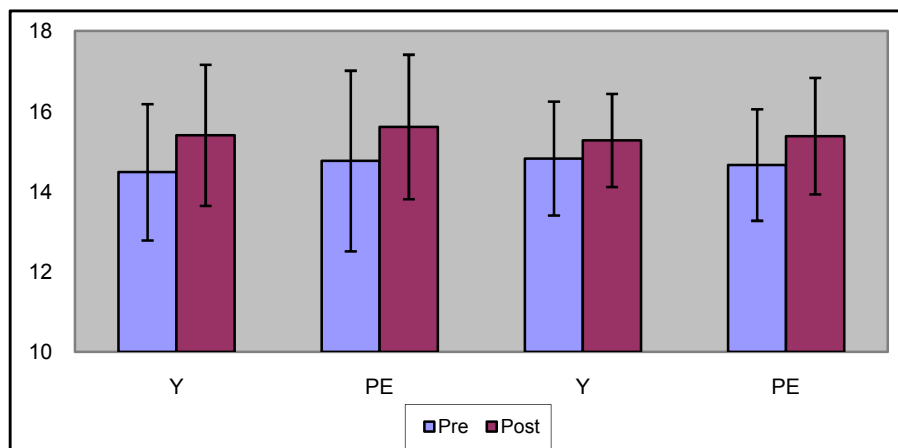
Fig. 5.1.4 A Mean \pm SD Psychological Health – Age wise



In age above and below 24 years, the pre-post scores on Psychological Health domain of the Yoga group indicated that there is improvement in the psychological health of the participants in the post assessment.

The Physical Exercise group also indicated better physical health in the post assessment.

Fig. 5.1.4 B Mean \pm SD Psychological Health – Gender wise



In both female and male groups, the pre-post scores on Psychological Health domain of the Yoga group indicated that there is improvement in the psychological health of the participants in the post assessment.

The Physical Exercise group also indicated better physical health in the post assessment.

5.1.5 – WHO QoL – 100 Domain 4 – Level of Independence (LOI) – LOI is a combination of 4 facets namely F9, F10, F11 and F12. F9 – Mobility, F10- Activities of daily living, F11 – Dependence on medication or treatments, F12 = Working capacity.

Data at baseline for both the groups were assessed for normal distribution using Kolmogorov Smirnov test. The baseline values were not normally distributed ($p = 0.000$). Mann-Whitney test was done to analyse the data between the groups and Wilcoxon Signed ranks test within groups.

Table 5.1.5 Mean \pm SD for Level of Independence

| | | Mean \pm SD | Mean \pm SD | p value | Y - PE |
|---------------------|----|------------------|------------------|---------|--------|
| | | Pre | Post | | Sig |
| Age \leq 24 years | Y | 15.71 \pm 1.64 | 15.80 \pm 1.87 | 0.453 | 0.982 |
| | PE | 15.34 \pm 1.80 | 15.92 \pm 1.72 | 0.002* | |
| | Y | 15.57 \pm 1.53 | 15.63 \pm 1.77 | 0.718 | 0.820 |
| | PE | 15.09 \pm 1.65 | 15.57 \pm 1.72 | 0.073 | |
| Age >24 years | Y | 15.92 \pm 1.79 | 16.05 \pm 2.00 | 0.594 | 0.814 |

| | | | | | |
|---------|----|------------|------------|--------|-------|
| Females | PE | 15.61±1.91 | 16.28±1.67 | 0.012* | 0.737 |
| | Y | 16.03±1.71 | 16.07±2.03 | 0.948 | |
| Males | PE | 15.52±1.95 | 16.05±1.69 | 0.045* | 0.684 |
| | Y | 15.50±1.60 | 15.64±1.74 | 0.337 | |
| | PE | 15.25±1.70 | 15.86±1.76 | 0.023* | |

- *Significant difference within the groups – (Wilcoxon Sigend Ranks Test)
- Y – Yoga group, PE – Physical Exercise.
- The PE group showed significant difference within the groups.
- The effect size (Y=0.05, PE =0.32) was more in Physical Exercise group than Yoga group.
- There was no significant difference between groups.

The pre assessment did not show any significant difference between the two groups.

The participants above 24 years showed significant difference in Physical Exercise group.

Analysis of the female and male participants showed significant difference in Physical Exercise (p=0.002) within the groups.

The post assessment also indicated that there is no significant difference between the two groups.

5.1.6 — WHO QoL – 100 Domain 4 – Social relations domain (SRD) – SRD is a combinations of 3 facets namely F13, F14 and F15. F13 – Personal relationships, F14- Social support, F15 – Sexual activity.

Data at baseline for both the groups were assessed for normal distribution using Kolmogorov Smirnov test. The baseline values were not normally distributed ($p < 0.001$). Man Whitney test was done to analyse the data between the groups and Wilcoxon Signed ranks test within groups.

.Table 5.1.6 Mean \pm SD for Social relations domain

| | | Mean \pm SD | Mean \pm SD | p value | Y – PE Sig |
|---------------------|----|------------------|------------------|---------|------------|
| | | Pre | Post | | |
| Age \leq 24 years | Y | 14.74 \pm 1.91 | 15.15 \pm 1.78 | 0.046* | 0.535 |
| | PE | 14.80 \pm 1.75 | 15.27 \pm 2.06 | 0.023* | |
| | Y | 14.32 \pm 1.80 | 14.60 \pm 1.40 | 0.349 | 0.661 |
| | PE | 14.48 \pm 1.61 | 14.50 \pm 1.91 | 0.809 | |
| Age >24 years | Y | 15.18 \pm 1.96 | 15.67 \pm 1.99 | 0.040* | 0.414 |
| | PE | 15.19 \pm 1.90 | 16.01 \pm 1.91 | 0.004* | |
| Females | Y | 14.96 \pm 2.10 | 15.30 \pm 2.17 | 0.205 | 0.705 |
| | PE | 14.97 \pm 1.97 | 15.38 \pm 2.44 | 0.153 | |
| Males | Y | 14.57 \pm 1.75 | 15.00 \pm 1.38 | 0.117 | 0.758 |

| | | | |
|----|------------|------------|-------|
| PE | 14.75±1.66 | 15.20±1.72 | 0.081 |
|----|------------|------------|-------|

- *Significant difference within the groups – (Wilcoxon Signed Ranks Test)
- Y – Yoga group, PE – Physical Exercise.
Both Y and PE group showed significant difference within the groups.

The effect size (Y=0.23, PE =0.23) was same in both Y and PE than.

There was no significant difference between groups.

The pre assessment did not show any significant difference between the two groups.

The participants above 24 years showed significant difference in both Yoga and Physical Exercise group.

The post assessment also indicated that there is no significant difference between the two groups.

5.1.7 — WHO QoL – 100 Domain 5 – Environmental Domain (ENVD) – ENVD is a combination of 8 facets namely F16, F17, F18, F19, F20, F21, F22, and F23. F16 – Physical safety and security, F17 – Home environment, F18 – Financial resources, F19 – Health and social care: accessibility and quality, F20 – Opportunities for acquiring new information and skills, F21 – Participation in and opportunities for recreation/leisure activities, F 22 – Physical environment (pollution, noise, traffic and climate) and F23 – Transportation.

Data at baseline for both the groups were assessed for normal distribution using Kolmogorov Smirnov test. The baseline values were not normally distributed ($p < 0.001$). Mann Whitney test was done to analyse the data between the groups and Wilcoxon Signed ranks test within groups.

Table 5.1.7 Mean ± SD for Environmental Domain

| | | Mean±SD | Mean±SD | P value | Y - PE sig |
|---------------|----|------------|------------|---------|------------|
| | | Pre | Post | | |
| Age ≤24 years | Y | 14.52±1.59 | 15.10±1.70 | 0.001* | 0.721 |
| | PE | 14.41±1.53 | 15.21±1.66 | <0.001* | |
| | Y | 14.47±1.85 | 15.02±1.68 | 0.036* | 0.871 |
| | PE | 14.31±1.61 | 15.02±1.74 | 0.011* | |
| Age >24 years | Y | 14.84±1.80 | 15.33±1.88 | 0.077 | 0.770 |
| | PE | 14.54±1.48 | 15.43±1.57 | <0.001* | |
| Females | Y | 14.85±1.75 | 15.30±1.54 | 0.087 | 0.910 |
| | PE | 14.47±1.47 | 15.21±1.70 | 0.014* | |
| Males | Y | 14.38±1.54 | 14.99±1.83 | 0.001* | 0.613 |
| | PE | 14.90±1.60 | 15.24±1.64 | <0.001* | |

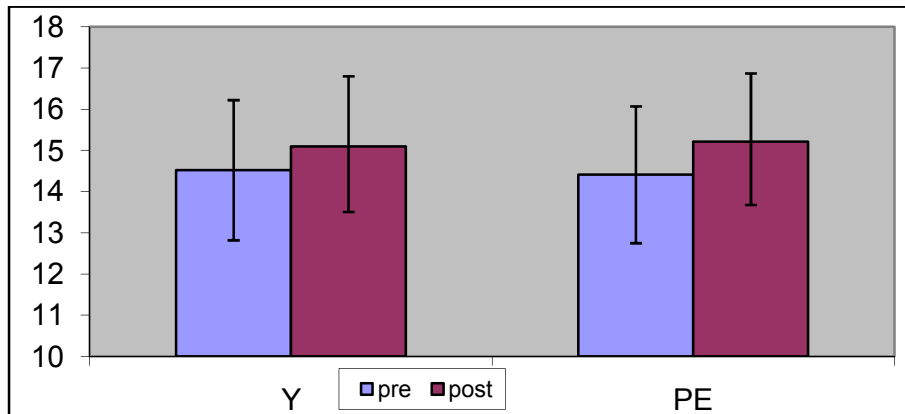
- *Significant difference within the groups – (Wilcoxon Signed Ranks Test)
- Y – Yoga group, PE – Physical Exercise.
- Both Y and PE group showed significant difference within the groups.
- The effect size (Y=0.35, PE =0.47) was more in PE than Y group.
- There was no significant difference between groups.

The participants above and below 24 years showed significant difference in Yoga group.

Analysis of the male participants showed significant difference in both Yoga and Physical Exercise.

The post assessment also indicated that there is no significant difference between the two groups.

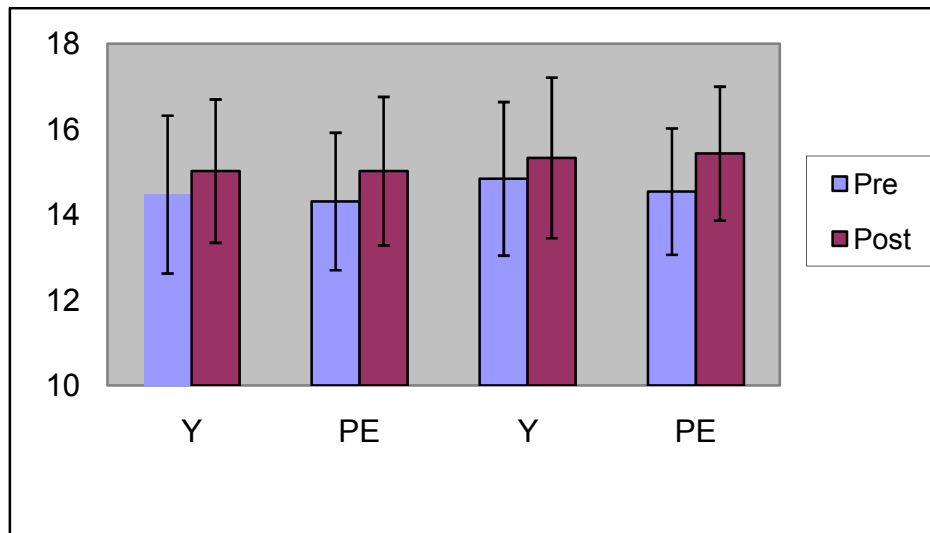
Fig. 5.1.7 Mean \pm SD Environmental Domain



The pre-post scores on Environmental domain of the Yoga group indicated that there is improvement in the psychological health of the participants in the post assessment.

The Physical Exercise group also indicated better physical health in the post assessment.

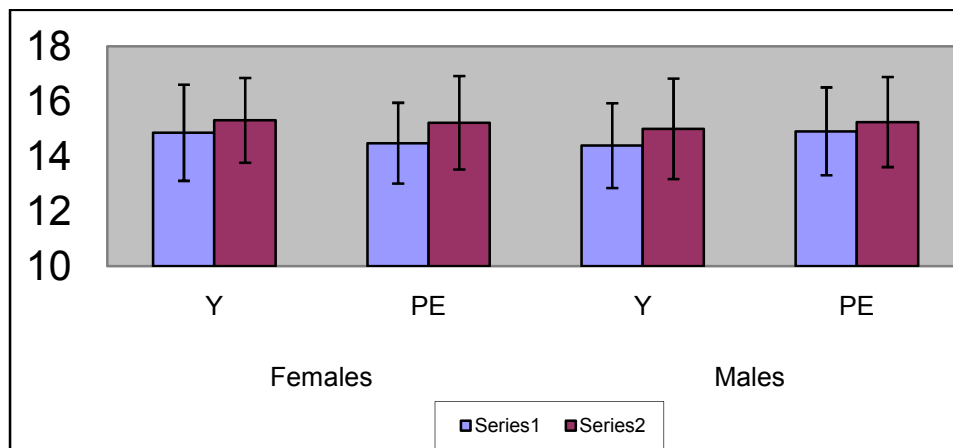
Fig. 5.1.7A Mean \pm SD Environmental Domain Age wise



In age above and below 24 years, the pre-post scores on Environmental domain of the Yoga group indicated that there is improvement in the Environmental health of the participants in the post assessment.

The Physical Exercise group also indicated better Environmental health in the post assessment.

Fig. 5.1.7 B Mean \pm SD Environmental Domain Gender wise



In both female groups and male groups, the pre-post scores on Environmental domain of the Yoga group indicated that there is improvement in the psychological health of the participants in the post assessment.

The Physical Exercise group also indicated better Environmental health in the post assessment.

5.1.8 — WHO QoL – 100 Domain 7 – 5.1.8 – Spiritual Domain (SD) – SD is only one facet named F24. F 24 – Spirituality/religion/personal beliefs.

Data at baseline for both the groups were assessed for normal distribution using Kolmogorov Smirnov test. The baseline values were not normally distributed ($p < 0.001$). Mann-Whitney test was done to analyse the data between the groups and Wilcoxon Signed ranks test within groups.

Table 5.1.8 Mean \pm SD for Spiritual Domain

| | | Mean \pm SD | Mean \pm SD | | Y - PE sig |
|---------------------|----|------------------|------------------|---------|------------|
| | | Pre | Post | p value | |
| Age \leq 24 years | Y | 15.10 \pm 2.24 | 16.11 \pm 2.37 | 0.001* | 0.567 |
| | PE | 15.02 \pm 2.29 | 15.93 \pm 2.76 | 0.008* | |
| | Y | 15.36 \pm 2.34 | 16.72 \pm 2.28 | 0.004* | 0.844 |
| | PE | 15.41 \pm 2.16 | 16.61 \pm 2.68 | 0.014* | |
| Age >24 years | Y | 14.93 \pm 2.22 | 15.56 \pm 2.39 | 0.193 | 0.700 |
| | PE | 14.66 \pm 2.36 | 15.31 \pm 2.69 | 0.282 | |
| Females | Y | 14.86 \pm 2.54 | 15.74 \pm 2.44 | 0.072 | 0.744 |
| | PE | 14.84 \pm 2.15 | 15.46 \pm 2.92 | 0.320 | |

| | | | | | |
|-------|----|------------|------------|--------|-------|
| Males | Y | 15.40±2.03 | 16.50±2.32 | 0.008* | 0.560 |
| | PE | 15.15±2.39 | 16.28±2.59 | 0.009* | |

- *Significant difference within the groups – (Wilcoxon Sigend Ranks Test)
- Y – Yoga group, PE – Physical Exercise.
- The effect size Y – 0.36, PE – 0.30
- Both Y and PE group showed significant difference within the groups.
- The effect size (Y=0.36, PE =0.30) was more in PE than Y group.
- There was no significant difference between groups.

The participants below 24 years showed significant difference within Yoga and Physical Exercise group.

Analysis of the male participants showed significant difference in both Yoga and Physical Exercise.

The post assessment also indicated that there is no significant difference between the two groups.

However there was no significant difference between groups.

5.2 – RESULTS - The Vedic Personality Inventory (VPI)

5.2.1. Demographic data - There were 87 females and males within the age range of 18 – 71 years. The mean age was 29.44±11.94. They belonged to different callings. Some were college

and training college students, some were engaged in different professionals and occupations, while some others were retired from active work.

Table 5.2.1 Demographic data for VPI

| | (n = 87) | (n = 87) |
|--------------------|-------------|-------------|
| Age (years) | 28.87 12.23 | 30.00±11.70 |
| Range | 18 – 71 | 18 - 58 |
| Female | 40 | 40 |
| Male | 47 | 47 |
| Category of people | | |
| Students | 49 | 44 |
| Employees | 18 | 30 |
| Housewives | 10 | 7 |
| Business | 10 | 6 |

- *Significant difference within the groups – (Wilcoxon Sigend Ranks Test)
- Y – Yoga group, PE – Physical Exercise.

Data at baseline for both the groups were assessed for normal distribution using Shapiro-Wilk's test. The baseline values were normally distributed for *Tamas* ($p=0.209$) and *Sattva* ($p=0.717$) and were well matched. Independent samples t-test was done to analyse the data between the groups and paired samples t-test within groups. The effect size (mean A – mean B)/SD of difference scores) is an absolute measure of the difference that exists between the

populations for a parameter, a concept first introduced by the sociologist J.Cohen was also calculated. (Cohen J, 1977).

5.2.2 - *Sattva* – Data at baseline for both the groups were assessed for normal distribution using Shapiro-Wilk’s test. The baseline values were normally distributed for and *Sattva* ($p=0.717$) and were well matched. Independent samples t-test was done to analyse the data between the groups and paired samples t-test within groups

Table 5.2.2 Mean \pm SD for *Sattva*

| | | Mean \pm SD | Mean \pm SD | p value | Effect size |
|---------------------|----|-----------------|-----------------|---------|-------------|
| | | Pre | Post | | |
| | Y | 4.88 \pm 0.52 | 5.26 \pm 0.51 | <0.001* | 0.61 |
| | PE | 4.91 \pm 0.53 | 5.21 \pm 0.65 | <0.001* | 0.45 |
| Age \leq 24 years | Y | 4.67 \pm 0.47 | 5.26 \pm 0.55 | <0.001* | |
| | PE | 4.79 \pm 0.44 | 5.14 \pm 0.65 | 0.002* | |
| Age >24 years | Y | 4.91 \pm 0.59 | 5.12 \pm 0.45 | 0.001* | |
| | PE | 5.00 \pm 0.59 | 5.09 \pm 0.62 | 0.014* | |
| Females | Y | 4.91 \pm 0.42 | 5.20 \pm 0.50 | 0.004* | |
| | PE | 4.98 \pm 0.58 | 5.23 \pm 0.62 | 0.034* | |
| Males | Y | 4.86 \pm 0.60 | 5.33 \pm 0.52 | <0.001* | |
| | PE | 4.80 \pm 0.49 | 5.19 \pm 0.68 | 0.001* | |

- *Significant difference within the groups – (Wilcoxon Sigend Ranks Test)

- Y – Yoga group, PE – Physical Exercise

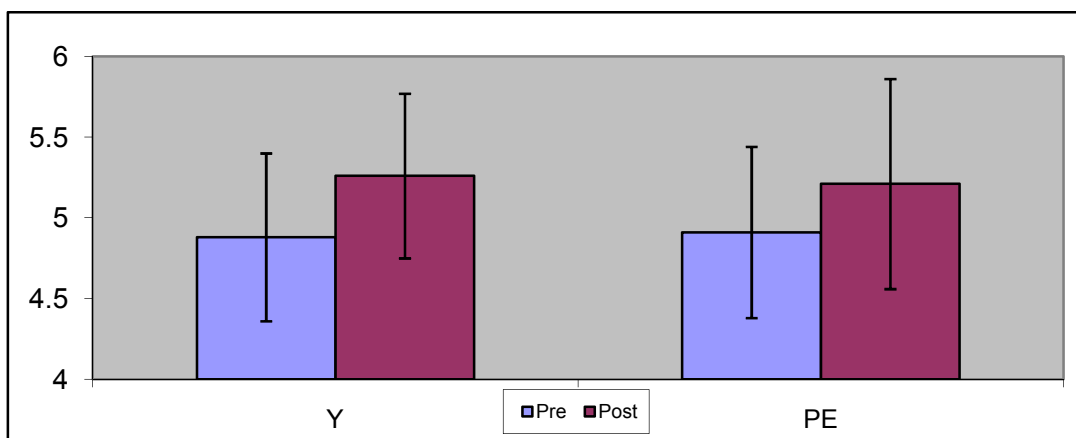
Both Yoga and Physical Exercise groups showed significant difference (Y - $p < 0.01$, PE - $p = 0.020$) within the groups. *Sattva* scores have increased significantly in both Yoga (4.88 to 5.26) ($p = 0.001$) and Physical Exercise groups (4.91 to 5.21) ($p < 0.001$) with a greater effect size in Yoga (0.61) than Physical Exercise (0.45) group.

The participants below and above 24 years showed significant increase in both Yoga and Physical Exercise group.

Analysis of both female and male participants also showed significant increase within Yoga and Physical Exercise group.

The post assessment also indicated that there is no significant difference between the two groups.

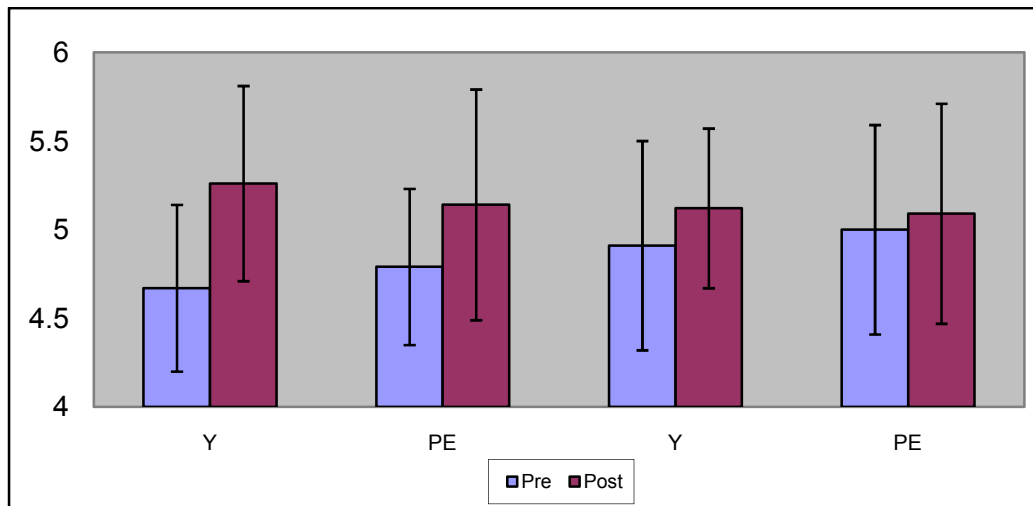
Fig. 5.2.2 Mean \pm SD Mean \pm SD for *Sattva*



The pre-post scores in the Yoga group indicated that there is improvement in the *Sattva* of the participants in the post assessment.

The Physical Exercise group also indicated better *Sattva* in the post assessment.

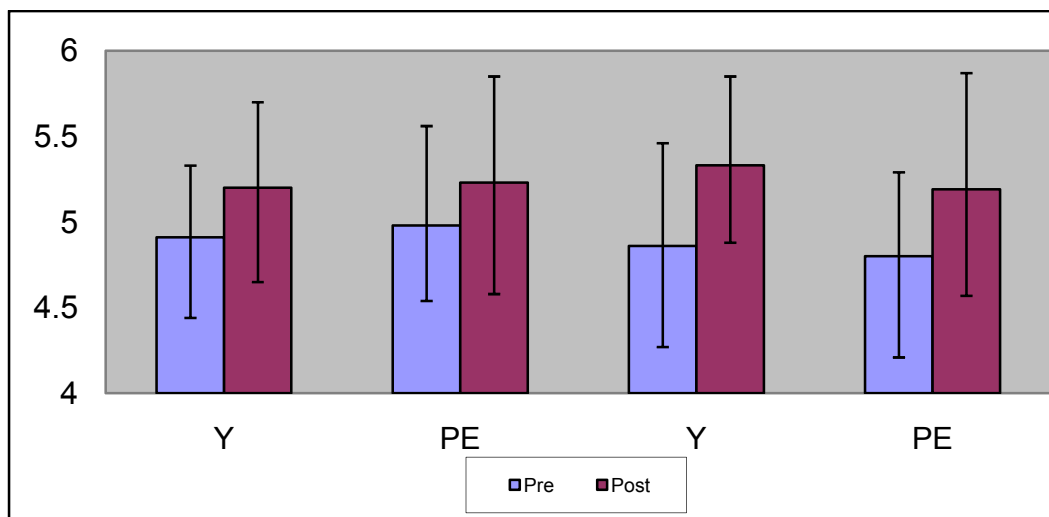
Fig. 5.2.2A Mean \pm SD Mean \pm SD for *Sattva* Age wise



In age group above and below 24 years, the pre-post scores of the Yoga group indicated that there is improvement in *Sattva* of the participants in the post assessment.

The Physical Exercise group also indicated better *Sattva* in the post assessment.

Fig. 5.2.2B Mean \pm SD Mean \pm SD for *Sattva* Gender wise



In both female and male groups, the pre-post scores of the Yoga group indicated that there is improvement in *Sattva* of the participants in the post assessment.

The Physical Exercise group also indicated better *Sattva* in the post assessment.

5.2.3 - Rajas - Data at baseline for both the groups were assessed for normal distribution using Shapiro-Wilk's test. The baseline values were normally distributed and were well matched. Independent samples t-test was done to analyse the data between the groups and paired samples t-test within groups

Table 5.2.3 Mean ± SD for Rajas

| | | Mean±SD | Mean±SD | p value | Effect size |
|---------------|----|-------------|-------------|---------|-------------|
| | | Pre | Post | | |
| | Y | 3.83 ± 0.62 | 3.72 ± 0.51 | 0.12 | 0.17 |
| | PE | 3.67 ± 0.62 | 3.43 ± 0.79 | 0.002* | 0.33 |
| Age ≤24 years | Y | 3.84 ± 0.66 | 3.99 ± 0.74 | 0.286 | |
| | PE | 3.75 ± 0.63 | 3.56 ± 0.75 | 0.152 | |
| Age >24 years | Y | 3.81 ± 0.61 | 3.51 ± 0.57 | 0.002* | |
| | PE | 3.62 ± 0.62 | 3.31 ± 0.83 | 0.015* | |
| Females | Y | 3.66 ± 0.62 | 3.43 ± 0.48 | 0.502 | |
| | PE | 3.64 ± 0.63 | 3.50 ± 0.80 | 0.196 | |
| Males | Y | 3.96 ± 0.63 | 3.96 ± 0.41 | 0.898 | |
| | PE | 3.73 ± 0.63 | 3.50 ± 0.79 | 0.014* | |

*Significant difference within the groups – (Wilcoxon Sigend Ranks Test)

• Y – Yoga group, PE – Physical Exercise.

* Rajas showed a significant difference between the groups (p=0.012)

* (Effect size = difference in means (post – Pre)/SD of the difference scores)

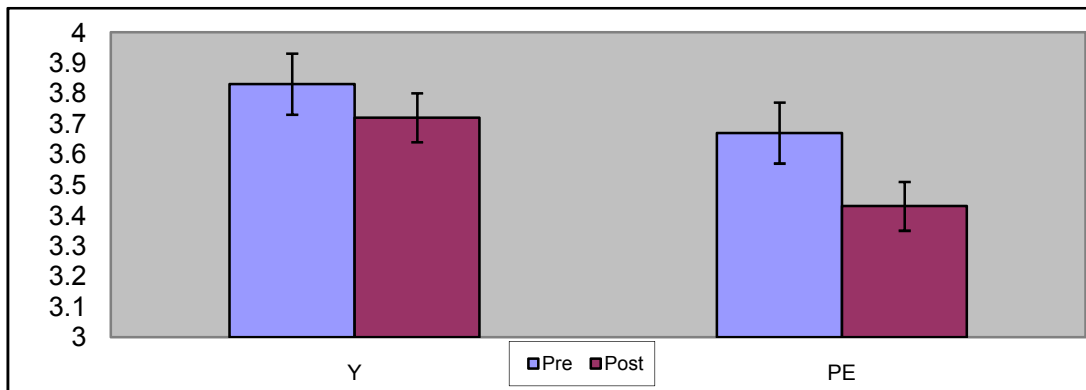
The PE group showed a significant decrease in scores from 3.67 to 3.43 (p=0.002).

The participants above 24 years showed significant decrease in both Yoga (3.81 to 3.51) (p=0.002) and Physical Exercise group (3.62 to 3.31) (p=0.015). The participants below 24 years showed significant decrease in Physical Exercise group (p=0.012).

Analysis of male participants showed significant decrease in the Physical Exercise group (3.73 to 3.37) (p=0.014).

The post assessment also indicated that there is a significant difference between the two groups.

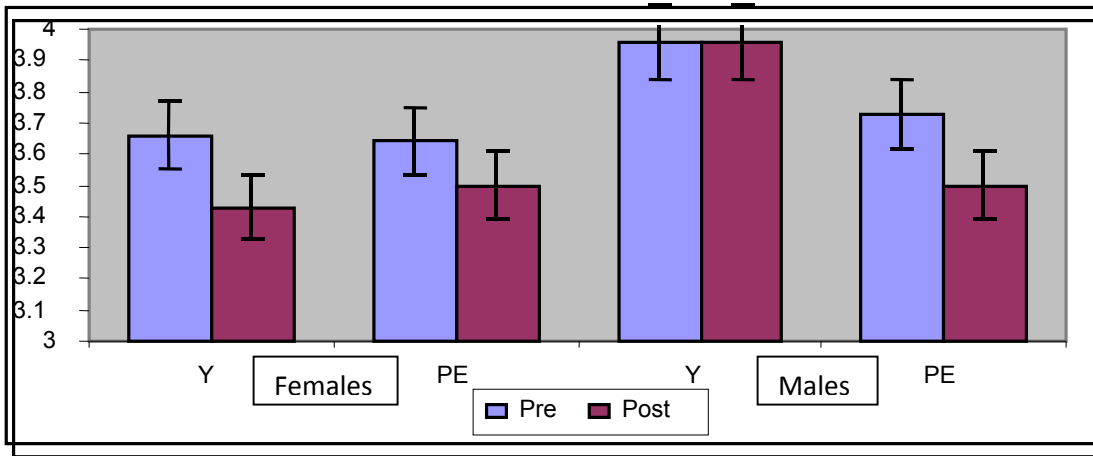
Fig. 5.2.3 Mean ± SD for *Rajas*



The pre-post scores in the Yoga group indicated that there is decrease in the *Rajas* of the participants in the post assessment.

The Physical Exercise group also indicated better *Rajas* in the post assessment.

Fig. 5.2.3A Mean ± SD for *Rajas* – Gender wise



In both female and male groups, the pre-post scores of the Yoga group indicated that there was a decrease in the *Rajas* of the participants in the post assessment.

The Physical Exercise group also indicated better decrease in the *Rajas* in the post assessment.

5.2.4 *Tamas* - Data at baseline for both the groups were assessed for normal distribution using Shapiro-Wilk's test. The baseline values were normally distributed for *Tamas* (0.209) and were well matched. Independent samples t-test was done to analyse the data between the groups and paired samples t-test within groups

Table 5.2.4 Mean \pm SD for *Tamas*

| | | Mean \pm SD | Mean \pm SD | p value | Effect size |
|---------------------|----|-----------------|-----------------|---------|-------------|
| | | Pre | Post | | |
| | Y | 3.12 \pm 0.51 | 2.97 \pm 0.91 | 0.095 | 0.18 |
| | PE | 3.24 \pm 0.67 | 2.99 \pm 0.69 | 0.01* | 0.36 |
| Age \leq 24 years | Y | 3.16 \pm 0.49 | 3.20 \pm 1.63 | 0.774 | |

| | | | | |
|--------------|----|-------------|-------------|--------|
| | PE | 3.28 ± 0.67 | 3.16 ± 2.13 | 0.4 |
| Age>24 years | Y | 3.09 ± 0.53 | 2.67 ± 0.69 | 0.001* |
| | PE | 3.21 ± 0.68 | 2.83 ± 0.77 | 0.001* |
| Females | Y | 3.15 ± 0.52 | 2.80 ± 1.04 | 0.04* |
| | PE | 3.20 ± 0.71 | 2.97 ± 0.71 | 0.053 |
| Males | Y | 3.11 ± 0.50 | 3.10 ± 0.58 | 0.924 |
| | PE | 3.28 ± 0.65 | 3.01 ± 0.46 | 0.032* |

- *Significant difference within the groups – (Wilcoxon Sigend Ranks Test)
- Y – Yoga group, PE – Physical Exercise.

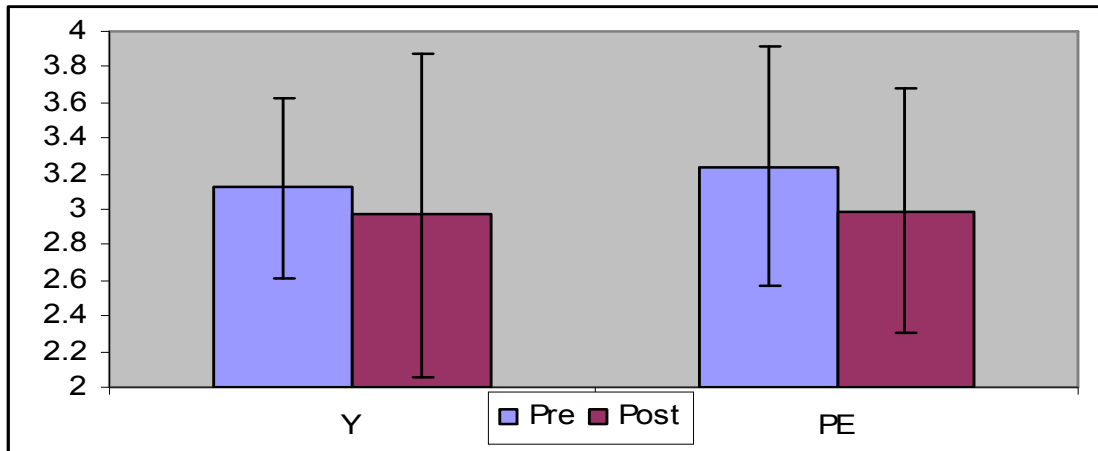
The PE group showed a significant decrease in the *Tamas* score from 3.24 to 2.99 (p=0.001).

The participants above 24 years showed significant decrease in both Yoga (3.09 to 2.67) (p=0.002) and Physical Exercise group (3.21 to 2.83).

Analysis of Female participants showed significant decrease in the Yoga group (p=0.040) and males showed significant decrease in Physical Exercise group (p=0.032).

The post assessment also indicated that there is no significant difference between the two groups.

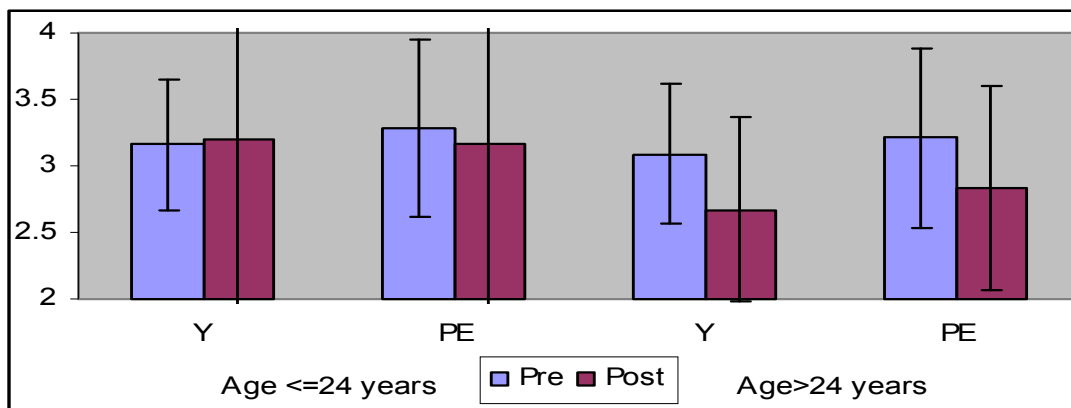
Figure 5.2.4 Mean ± SD for *Tamas*



The pre-post scores in the Yoga group indicated that there was a decrease in the *Tamas* of the participants in the post assessment.

The Physical Exercise group also indicated decrease in *Tamas* in the post assessment.

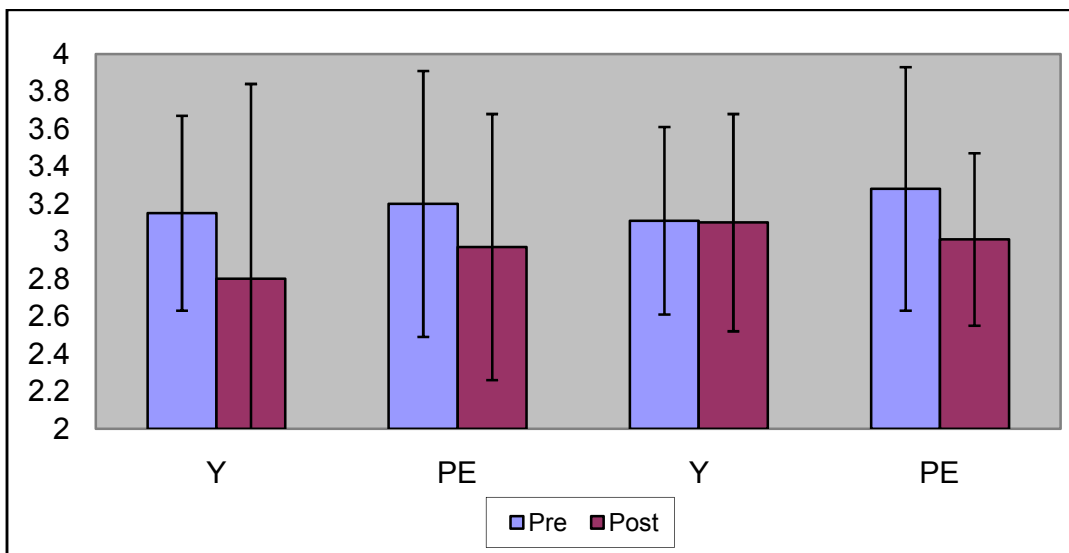
Figure 5.2.4A Mean ± SD for *Tamas* – Age wise



In age group above and below 24 years, the pre-post scores of the Yoga group indicated that there was a decrease in *Tamas* of the participants in the post assessment.

The Physical Exercise group also indicated decrease in *Tamas* in the post assessment.

Figure 5.2.4B Mean ± SD for *Tamas* – Gender wise



In both female and male groups, the pre-post scores of the Yoga group indicated that there is decrease in the *Tamas* of the participants in the post assessment.

The Physical Exercise group also indicated better decrease in the *Tamas* in the post assessment.

5.3 RESULTS - “The ‘G’ Inventory of Personality” (GIN)

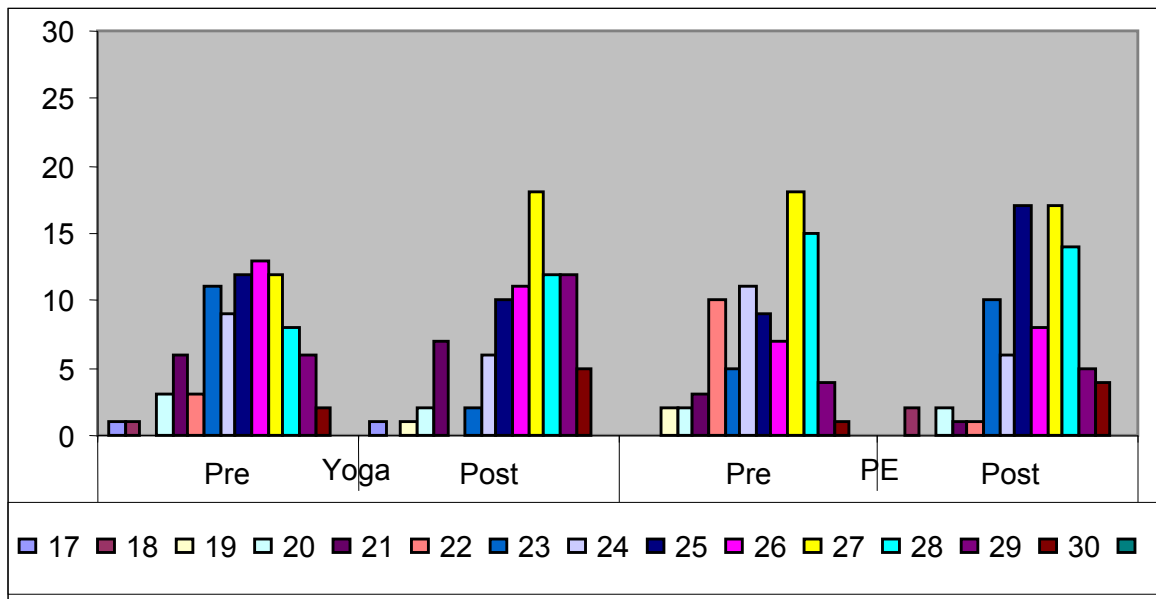
5.3.1 - Table 5.3.1 shows the scores obtained in “The ‘G’ Inventory of Personality”. There were 87 females and males within the age range of 18 – 71 years. More scores have been noticed in between the scores of 23 to 28.

Table 5.3.1 “The ‘G’ Inventory of Personality” - Scores obtained

| Scores | Yoga | | PE | |
|--------|------|------|-----|------|
| | Pre | Post | Pre | Post |
| 17 | 1 | 1 | - | - |
| 18 | 1 | - | - | 2 |
| 19 | - | 1 | 2 | - |
| 20 | 3 | 2 | 2 | 2 |
| 21 | 6 | 7 | 3 | 1 |
| 22 | 3 | - | 10 | 1 |

| | | | | |
|-------|----|----|----|----|
| 23 | 11 | 2 | 5 | 10 |
| 24 | 9 | 6 | 11 | 6 |
| 25 | 12 | 10 | 9 | 17 |
| 26 | 13 | 11 | 7 | 8 |
| 27 | 12 | 18 | 18 | 17 |
| 28 | 8 | 12 | 15 | 14 |
| 29 | 6 | 12 | 4 | 5 |
| 30 | 2 | 5 | 1 | 4 |
| Total | 87 | 87 | 87 | 87 |

Figure 5.3.1 Scores obtained in Yoga, Physical Exercise

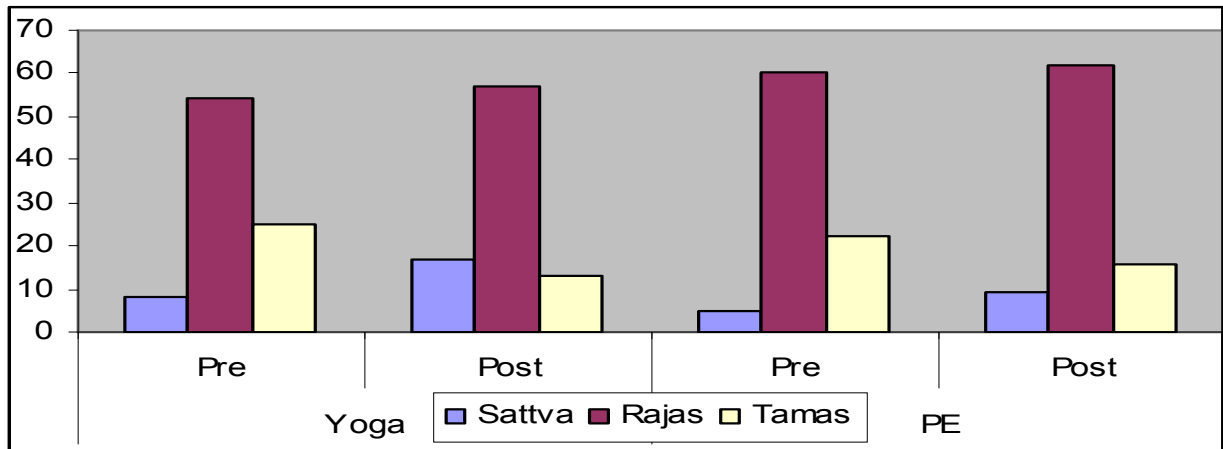


5.3.2 - The “The ‘G’ Inventory of Personality” gives a single overall score that describes the disposition of an individual towards *Sattva*, *Rajas* or *Tamas*. The ranges are: 29-30 for *Sattva*, 24-28 for *Rajas* and *Tamas* for scores less than 24. Table 5.2.4 describes the number of people who have changed over from one *Guṇa* type to another based on this characterization.

Table 5.3.2 Improvement in *Guṇas* in “The ‘G’ – Inventory of Personality”

| Personality | Yoga | | PE | |
|---------------|------|------|-----|------|
| | Pre | Post | Pre | Post |
| <i>Sattva</i> | 8 | 17 | 5 | 9 |
| <i>Rajas</i> | 54 | 57 | 60 | 62 |
| <i>Tamas</i> | 25 | 13 | 22 | 16 |

Figure 5.3.2 Improvement in *Guṇas* in Yoga, Physical Exercise



In Yoga group *Sattva* and *Rajas* participants have increased whereas *Tamas* Participants have decreased.

In Physical Exercise group also the same trend was noticed

5.3.3 - The question of interest was whether an individual's *Guṇa* type changes after intervention. To ascertain this, three different McNemar's tests were done to check the change from presence of a *Guṇa* to its absence. Thus, the McNemar test was done to ascertain the

significance of shifts of the number of subjects who were predominantly of non-*Sattva* type before intervention to *Sattva* type after intervention. The same was done for non-*Rajas* to *Rajas* and non-*Tamas* to *Tamas* types.

A cross-tabulation of the shifts of *Guṇa* types for each group is presented in Table 5.3.3 for yoga group. The cross-tabulation is to be interpreted as follows: In the Yoga group, 3 subjects who were of *Sattva* type remained so after intervention. 65 who were non-*Sattva* types remained so. 14 subjects who were non-*Sattva* types before were of *Sattva* types afterwards and 5 who were *Sattva* types before were of non-*Sattva* types after intervention. A similar interpretation holds for *Rajas* and *Tamas*.

Table 5.3.3 – Cross-tabulation of *Sattva*, *Rajas* and *Tamas* before and after - Yoga group

| | <i>Sattva</i> | | <i>Rajas</i> | | <i>Tamas</i> | | | |
|--------------------------------|---------------|-------------------------------|-------------------------------|------------------------------|--------------|-------------------------------|---|----|
| | before | Non <i>Sattva</i> after | before | Non <i>Rajas</i> after | before | Non <i>Tamas</i> after | | |
| <i>Sattva</i> before | 3 | 5 | <i>Rajas</i> before | 35 | 19 | <i>Tamas</i> before | 7 | 18 |
| Non <i>Sattva</i> before | 14 | 65 | Non <i>Rajas</i> before | 22 | 11 | Non <i>Tamas</i> before | 6 | 56 |

5.3.4 - A cross-tabulation of the shifts of *Guṇa* types for each group is presented in Table 5.3.4 for PE group. The cross-tabulation is to be interpreted as follows: In the PE group, 4 subjects who were of *Sattva* type remained so after intervention. 77 who were non-*Sattva* types remained so. 5 subjects who were non-*Sattva* types before were of *Sattva* types afterwards and 1 who was

Sattva type before was of non-*Sattva* type after intervention. A similar interpretation holds for *Rajas* and *Tama*

Table 5.3.4 – Cross-tabulation of *Sattva*, *Rajas* and *Tamas* before and after in PE group

| | <i>Sattva</i> after | <i>Non-Sattva</i> after | <i>Rajas</i> after | <i>Non-Rajas</i> after | <i>Tamas</i> After | <i>Non-Tamas</i> after | | |
|-----------------------------|------------------------|----------------------------|----------------------------|---------------------------|-----------------------|---------------------------|---|----|
| <i>Sattva</i> before | 4 | 1 | <i>Rajas</i> before | 48 | 12 | <i>Tamas</i> before | 9 | 13 |
| <i>Non-Sattva</i> before | 5 | 77 | <i>Non Rajas</i> before | 14 | 13 | <i>NonTamas</i> before | 7 | 58 |

5.3.5 – Table 5.3.5 shows the significance level of both Y and PE group. In the Y group, there is a significant reduction in the number of people of *Tamas* type ($p=0.023$). There is a marginally significant increase in people of *Sattva* type ($p=0.064$). *Rajas* type people did not change significantly. In the PE group, no significant changes are seen for any of the transitio

Table 5.3.5 – Results of McNamara’s test

| | | <i>Sattva – Non Sattva</i> | <i>Rajas – Non Rajas</i> | <i>Tamas – Non Tamas</i> |
|--------------|-----|--------------------------------|------------------------------|--------------------------|
| | No. | 87 | 87 | 87 |
| Significance | Y | 0.064 | 0.755 | 0.023 |
| | PE | 0.219 | 0.845 | 0.263 |

5.4 – RESULTS - Self-Esteem Questionnaire (SEQ)

The results of the Self-esteem Questionnaire (SEQ) administered to the subjects are summarized below.

5.4.1. Competency (COM) –

Data at baseline for both the groups were assessed for normal distribution using Kolmogorov test. The baseline values were normally distributed for Competency and were well matched. Independent samples t-test was done to analyse the data between the groups and paired samples t-test within the groups

Table 5.4.1. Mean ± SD for Competency of Self-esteem

| | | Mean±SD | Mean±SD | p value |
|---------------|----|--------------|--------------|---------|
| | | Pre | Post | |
| | Y | 42.90 ± 6.90 | 44.47 ± 6.66 | 0.105 |
| | PE | 43.44 ± 7.04 | 45.23 ± 6.08 | 0.033* |
| Age ≤24 years | Y | 42.86 ± 6.14 | 43.67 ±6.71 | 0.407 |
| | PE | 42.34 ±7.82 | 45.07 ±6.47 | 0.035* |
| Age>24 years | Y | 42.94 ±7.94 | 45.61 ±6.51 | 0.165 |
| | PE | 44.56 ±6.03 | 45.40 ±5.74 | 0.443 |
| Females | Y | 42.33 ±7.70 | 44.10 ± 6.60 | 0.170 |
| | PE | 43.00 ± 6.63 | 45.26 ± 5.51 | 0.70 |

| | | | | |
|-------|----|--------------|--------------|-------|
| Males | Y | 43.35 ± 6.22 | 44.77 ± 6.76 | 0.322 |
| | PE | 43.78 ± 7.39 | 45.20 ± 6.55 | 0.217 |

The pre assessment did not show any significant difference between the two groups.

The Physical Exercise group (43.44 to 45.23) (p=0.033) showed a significant increase within the group.

The participants below 24 years showed significant increase within the Physical Exercise group (42.34 to 45.07) (p=0.035).

The post assessment also indicated that there is no significant difference between the two groups.

5.4.2 - Global Self-Esteem (GSE) –

Data at baseline for both the groups were assessed for normal distribution using Kolmogorov test. The baseline values were normally distributed for Global Self Esteem and were well matched. Independent samples t-test was done to analyse the data between the groups and paired samples t-test within the groups

Table 5.4.2. Mean ± SD for Global Self-esteem

| Mean±SD | Mean±SD | p value | Effect size |
|---------|---------|---------|-------------|
| Pre | Post | | |

| | | | | | |
|---------------|----|---------------|---------------|--------|------|
| | Y | 46.68 ± 10.43 | 49.47 ± 8.41 | 0.036* | 0.16 |
| | PE | 48.67 ± 8.51 | 50.39 ± 9.13 | 0.129 | 0.00 |
| Age ≤24 years | Y | 47.49 ± 9.03 | 48.22 ±9.91 | 0.895 | |
| | PE | 47.43 ±7.59 | 49.70 ±9.65 | 0.365 | |
| Age>24 years | Y | 45.53±12.19 | 51.25 ±8.46 | 0.030* | |
| | PE | 49.93 ±9.28 | 51.09 ±8.63 | 0.364 | |
| Females | Y | 45.00 ±12.04 | 50.49 ± 8.51 | 0.045* | |
| | PE | 48.68 ± 9.35 | 51.32 ± 9.01 | 0.125 | |
| Males | Y | 48.04 ± 8.80 | 48.65 ± 10.09 | 0.938 | |
| | PE | 48.65 ± 7.89 | 49.67 ± 9.26 | 0.808 | |

The pre assessment did not show any significant difference between the two groups.

The Yoga group (46.68 to 49.47) (p=0.036) showed a significant increase.

The participants above 24 years showed significant increase within the Yoga group (45.53 to 51.25) (p=0.030).

Analysis of the Female participants showed significant increase within the Yoga group (45.00 to 50.49 ($p= 0.045$)).

The post assessment also indicated that there is no significant difference between the two groups.

5.4.3 Moral and Self-esteem (MSE)– Data at baseline for both the groups were assessed for normal distribution using Kolmogorov test. The baseline values were normally distributed for Moral and Self Esteem and were well matched. Independent samples t-test was done to analyse the data between the groups and paired samples t-test within the groups.

Table 5.4.3. Mean \pm SD for Moral and Self-esteem

| | | Mean \pm SD | Mean \pm SD | p value | Effect size |
|---------------------|----|------------------|------------------|---------|-------------|
| | | Pre | Post | | |
| | Y | 34.78 \pm 6.10 | 37.31 \pm 5.79 | 0.003* | 0.32 |
| | PE | 37.51 \pm 5.03 | 37.40 \pm 6.36 | 0.762 | 0.01 |
| Age \leq 24 years | Y | 35.12 \pm 5.49 | 35.84 \pm 5.52 | 0.113 | |
| | PE | 36.84 \pm 4.79 | 36.50 \pm 5.06 | 0.523 | |
| Age >24 years | Y | 34.31 \pm 6.92 | 39.39 \pm 5.59 | 0.04* | |
| | PE | 38.19 \pm 5.23 | 38.33 \pm 5.55 | 0.004* | |
| Females | Y | 33.59 \pm 7.10 | 37.77 \pm 6.46 | 0.001* | |
| | PE | 37.08 \pm 5.49 | 38.42 \pm 5.46 | 0.171 | |

| | | | | |
|-------|----|--------------|--------------|-------|
| | Y | 35.75 ± 5.02 | 36.94 ± 5.22 | 0.226 |
| Males | | | | |
| | PE | 37.84 ± 4.67 | 36.61 ± 5.20 | 0.612 |

The pre assessment did not show any significant difference between the two groups.

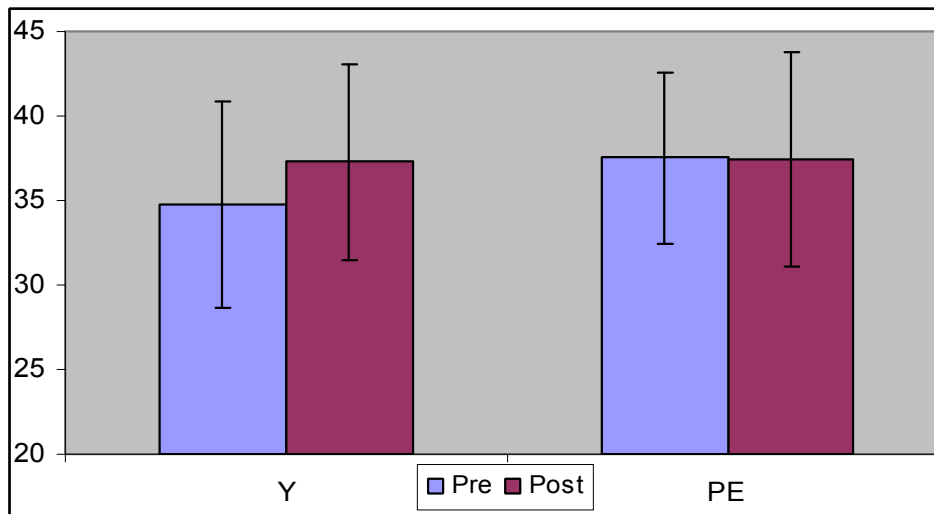
The Yoga group (34.78 to 37.31) (p=0.003) showed a significant increase.

The participants above 24 years showed significant increase within the Yoga group (34.31 to 39.39) (p=0.004).

Analysis of the Female participants showed significant increase within the Yoga group (33.59 to 37.77) (p=0.001)

The post assessment also indicated that there is no significant difference between the two groups.

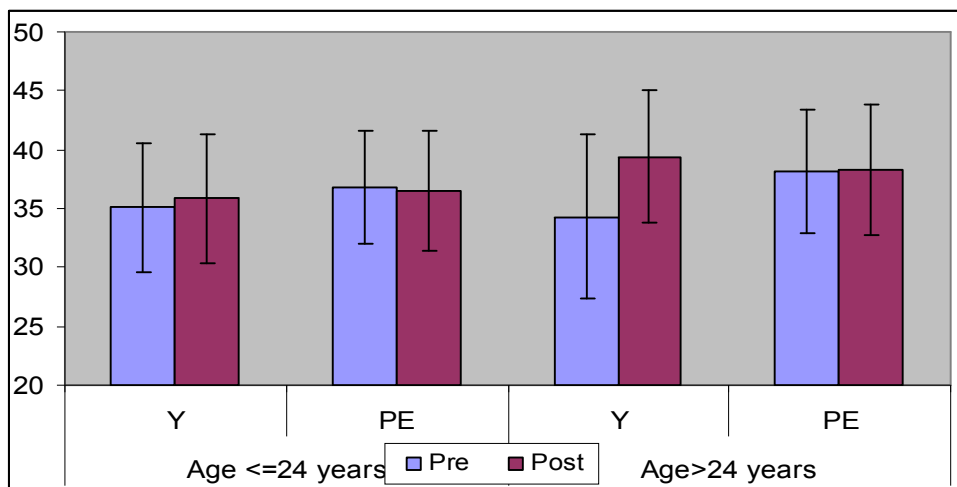
Figure 5.4.3. Mean ± SD - Moral and Self-esteem of Self Esteem



The pre-post scores on Moral and Self Esteem domain of the Yoga group indicated that there is improvement in the moral and self esteem of the participants in the post assessment.

The Physical Exercise group also indicated better Moral and Self Esteem in the post assessment.

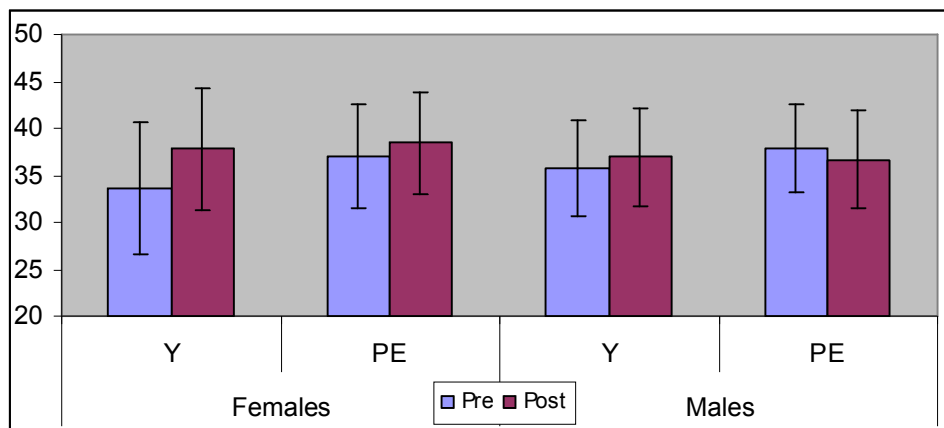
Figure 5.4.3A Mean \pm SD - Moral and Self-esteem of Self Esteem – Age wise



In age above and below 24 years, the pre-post scores on Moral and Self Esteem domain of the Yoga group indicated that there is improvement in the Moral and Self Esteem of the participants in the post assessment.

The Physical Exercise group also indicated better Moral and Self Esteem in the post assessment.

Figure 5.4.3B Mean \pm SD - Moral and Self-esteem of Self Esteem – Gender wise



In both female and male groups, the pre-post scores on Moral and Self Esteem domain of the Yoga group indicated that there is improvement in the Moral and Self Esteem of the participants in the post assessment.

The Physical Exercise group also indicated better Moral and Self Esteem in the post assessment.

5.4.4 - Social Self-esteem (SSE) – Data at baseline for both the groups were assessed for normal distribution using Kolmogorov test. The baseline values were normally distributed for Social Self - Esteem and were well matched. Independent samples t-test was done to analyse the data between the groups and paired samples t-test within the groups.

Table 5.4.4. Mean ± SD for Social Self-esteem of

| | | Mean±SD | Mean±SD | p value |
|----------------|----|--------------|--------------|---------|
| | | Pre | Post | |
| | Y | 31.31± 4.89 | 32.30± 4.23 | 0.129 |
| | PE | 32.62± 4.36 | 33.32± 4.75 | 0.199 |
| Age <=24 years | Y | 31.25 ± 4.48 | 31.16 ±3.87 | 0.669 |
| | PE | 31.95 ±3.86 | 32.57 ±4.91 | 0.112 |
| Age>24 years | Y | 31.39±5.48 | 33.92 ±4.23 | 0.023* |
| | PE | 33.30 ±4.77 | 34.09 ±4.51 | 0.499 |
| Females | Y | 31.28 ±5.80 | 33.41 ± 4.38 | 0.006* |
| | PE | 32.63 ± 4.56 | 34.03 ± 4.86 | 0.156 |
| Males | Y | 31.33 ± 4.08 | 31.40 ± 3.92 | 0.787 |
| | PE | 32.61 ± 4.35 | 32.78 ± 4.64 | 0.454 |

The pre assessment did not show any significant difference between the two groups.

The participants above 24 years showed significant increase within the Yoga group (31.39 to 33.92) (p=0.023)

Analysis of the Female participants showed significant increase within the Yoga group (31.28 to 33.41) (p=0.006)

The post assessment also indicated that there is no significant difference between the two groups.

5.4.5 Family Self-esteem (FSE) – Data at baseline for both the groups were assessed for normal distribution using Kolmogorov test. The baseline values were normally distributed for Social Self - Esteem and were well matched. Independent samples t-test was done to analyse the data between the groups and paired samples t-test within the groups.

Table 5.4.5. Mean ± SD for Family Self-esteem of Self-esteem

| | | Mean±SD | Mean±SD | p value |
|----------------|----|--------------|--------------|---------|
| | | Pre | Post | |
| Age <=24 years | Y | 36.11± 8.64 | 36.33± 8.87 | 0.171 |
| | PE | 37.67± 5.76 | 36.21± 8.04 | 0.311 |
| | Y | 37.02 ± 7.13 | 35.08 ±8.87 | 0.417 |
| | PE | 38.45 ±4.93 | 34.48 ±8.84 | 0.634 |
| Age>24 years | Y | 34.83±10.38 | 38.11 ±8.69 | 0.002* |
| | PE | 36.86 ±6.46 | 37.98 ±6.78 | 0.905 |
| Females | Y | 35.15 ±9.67 | 37.36 ± 8.87 | 0.003* |
| | PE | 37.26 ± 6.37 | 37.26 ± 7.63 | 0.259 |
| Males | Y | 36.90 ± 7.72 | 35.50 ± 8.89 | 0.254 |
| | PE | 37.98 ± 5.29 | 35.59 ± 8.32 | 0.109 |

The pre assessment did not show any significant difference between the two groups.

The participants above 24 years showed significant increase within the Yoga group (34.83 to 38.11) (p=0.002).

Analysis of the Female participants showed significant increase within the Yoga group (35.15 to 37.36) (p=0.003).

The post assessment also indicated that there is no significant difference between the two groups.

5.4.6 Body and physical appearance (BPA) – Data at baseline for both the groups were assessed for normal distribution using Kolmogorov test. The baseline values were normally distributed for Social Self - Esteem and were well matched. Independent samples t-test was done to analyse the data between the groups and paired samples t-test within the groups.

Table 5.4.6 Mean ± SD for Body and physical appearance

| | | Mean±SD | Mean±SD | p value | Effect size |
|----------------|----|--------------|--------------|---------|-------------|
| | | Pre | Post | | |
| | Y | 24.56 ± 5.15 | 26.23 ± 4.29 | 0.003* | 0.33 |
| | PE | 25.55 ± 5.49 | 25.79 ± 4.61 | 0.705 | 0.04 |
| Age <=24 years | Y | 24.98 ± 5.54 | 26.20 ±4.62 | 0.145 | |
| | PE | 25.93 ±6.58 | 26.59 ±5.11 | 0.002* | |

| | | | | |
|--------------|----|--------------|--------------|--------|
| Age>24 years | Y | 23.97±4.54 | 26.28 ±3.84 | 0.107 |
| | PE | 25.16 ±4.15 | 24.95 ±3.94 | 0.473 |
| Females | Y | 23.05 ±5.94 | 25.56 ± 4.80 | 0.185 |
| | PE | 24.50 ± 4.46 | 25.66 ± 4.05 | 0.100 |
| Males | Y | 25.79 ± 4.07 | 26.77 ± 3.79 | 0.382 |
| | PE | 25.37 ± 6.10 | 25.90 ± 5.05 | 0.047* |

The pre assessment did not show any significant difference between the two groups.

A significant improvement is noticed in Yoga group (24.56 to 26.23) (p=0.003).

The participants below 24 years showed significant increase within the Physical Exercise group (25.93 to 26.59) (p=0.002)

Analysis of the Male participants showed significant increase within the Physical Exercise group (26.37 to 25.90) (p=0.047)

The post assessment also indicated that there is no significant difference between the two groups.

5.4.7 Effect size for Self-esteem domains The effect size is an absolute measure of the difference that exists between populations for a parameter. Table 5.4.8 shows that the effect sizes are clearly larger for the group that did yoga

TABLE 5.4.8 Effect size for Self-esteem domains

| BP | | GSE | | MSC | |
|-----|-----|-----|------|-----|-----|
| Y | PE | Y | PE | Y | PE |
| 0.3 | 0.0 | 0.2 | | 0.3 | 0.0 |
| | | | 0.16 | | |
| 3 | 4 | 1 | | 2 | 1 |

(Effect size = difference in means (after – before)/SD of the difference score

5.5 – RESULTS - Verbal Aggressive Scale (VAS) - The statistical tests used were paired samples t test for pre-post comparison and ANCOVA for change score comparison of the two groups. Interaction between males and females in their change scores in yoga and control groups was checked by RMANOVA. As the study population had a wide age range, analysis was also carried out by considering the median age of 25 as the value for grouping them as juniors (age<= 25 years) and seniors (age> 25 years). The interaction between these two groups in their change score were also checked by RMANOVA.

5.5.1 Improvement in Verbal Aggressiveness Scale - Table 5.5.1 gives the improvement in VAS.

There were 10 subjects with low score, 156 subjects with moderate scores and 7 subjects with high scores.

Table 5.5.1 Improvement in Verbal Aggressiveness Scale

| Scores | | Yoga | | PE | |
|----------|--------------------------------|--------|-------|--------|-------|
| | | Before | After | Before | After |
| 20 – 46 | Low verbal aggressiveness | 3 | - | 7 | 1 |
| 47 – 73 | Moderate verbal aggressiveness | 79 | 83 | 77 | 82 |
| 74 – 100 | High verbal aggressiveness | 2 | 1 | 5 | 6 |

5.5.2 The Verbal Aggressive Score -Table 5.5.2 shows the changes after the intervention in the two groups.

Table 5.5.2 Mean \pm SD for Verbal Aggressive Scale

| | n | Y | | | N | PE | | | p† |
|---------------------|----|------------------|------------------|-------|----|-------------------|------------------|-------|-------|
| | | Before | After | P* | | Before | After | P* | |
| Whole group | 84 | 59.77 \pm 7.51 | 57.36 \pm 6.20 | 0.017 | 89 | 58.71 \pm 9.25 | 59.93 \pm 8.63 | 0.268 | 0.013 |
| Age \leq 25 years | 47 | 60.31 \pm 7.10 | 57.60 \pm 6.32 | 0.072 | 41 | 58.31 \pm 10.06 | 59.49 \pm 8.83 | 0.532 | |
| Age > 25 years | 37 | 59.15 \pm 8.01 | 57.09 \pm 6.14 | 0.126 | 48 | 59.02 \pm 8.67 | 60.28 \pm 8.54 | 0.346 | |
| Females | 40 | 60.38 \pm 7.96 | 57.74 \pm 6.48 | 0.053 | 80 | 58.55 \pm 8.97 | 61.25 \pm 7.38 | 0.73 | |
| Males | 44 | 59.23 \pm 7.96 | 57.20 \pm 6.48 | 0.156 | 49 | 58.84 \pm 8.91 | 58.86 \pm 7.38 | 0.987 | |

Legend: p* = significance pre-post within groups (paired t test).

p† = significance between groups (ANCOVA with pre values as covariate).

n = Number

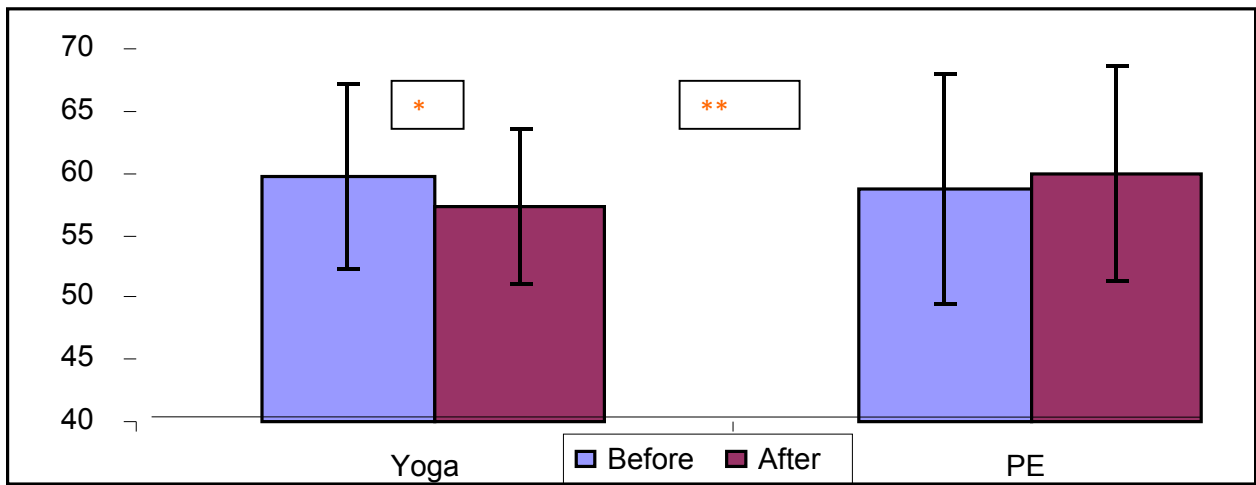
The pre assessment did not show any significant difference between the two groups.

A significant decrease is noticed in Yoga group (59.77 \pm 7.51 to 57.36 \pm 6.20). There was a non-significant increase in Physical Exercise group (58.71 \pm 9.25 to 59.93 \pm 8.63).

The post assessment also indicated that there was a significant difference between the two groups (p=0.013) on ANCOVA considering the pre values as a covariate.

RMANOVA for interaction between males and females (p=0.68) and the two age groups (p>0.50) showed no significant differences between groups.

Figure 5.5.2 Mean \pm SD for Verbal Aggressive Scale



- *Significance within the groups.
- ** Significance between the groups

A significant improvement is noticed in Yoga group.

There was a non significant increase Physical Exercise Group.

There was a significant difference between the Yoga and Physical Exercise Group.

5.6 – RESULTS – Satisfaction with Life Scale (SWLS). Data at baseline for both the groups were assessed for normal distribution using Kolmogorov Smirnov test which showed that the data was normally distributed. RMANOVA was done for checking homogeneity of base line scores of the two groups which showed that there was no between group difference.

Table 5.6.1 shows the changes after the intervention in the two groups. An analysis based on gender showed the significant differences in Y group in both male and females whereas significant difference observed in males in PE group. Age analysis showed significant difference within juniors and seniors (≤ 23.50 years & > 23.50 years) in Y group whereas significant difference observed in juniors. Refer Table 5.6.1).

TABLE 5.6.1 Descriptive statistics for SWLS

| | Y | | | PE | | |
|-------------------|--------------|--------------|----------------|--------------|--------------|----------------|
| | Mean±SD | Mean±SD | <i>P value</i> | Mean±SD | Mean±SD | <i>P value</i> |
| | Before | After | | Before | After | |
| | 23.80 ± 3.91 | 26.55 ± 4.00 | <0.001* | 23.99 ± 5.15 | 26.96 ± 4.47 | <0.001* |
| Age ≤ 23.50 years | 23.03 ± 3.80 | 26.63 ± 4.49 | <0.001* | 23.03 ± 5.42 | 27.15 ± 4.34 | <0.001* |
| Age > 23.50 years | 24.89 ± 3.95 | 26.84 ± 3.59 | 0.002* | 24.95 ± 4.75 | 26.78 ± 4.65 | 0.020* |
| Female | 24.64 ± 4.20 | 26.78 ± 3.43 | 0.002* | 24.82 ± 5.84 | 27.12 ± 4.28 | 0.023* |
| Male | 23.11 ± 3.56 | 26.36 ± 4.44 | <0.001* | 23.37 ± 4.55 | 26.85 ± 4.65 | <0.001* |

The pre assessment did not show any significant difference between the two groups.

A significant improvement was noticed in Yoga group (23.80 to 26.55) ($p < 0.001$).

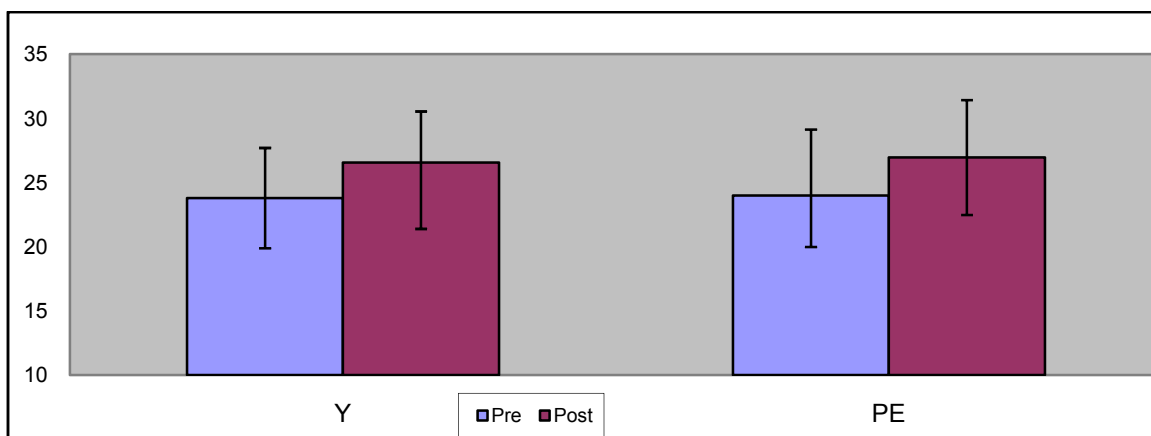
A significant improvement was also noticed in Physical Exercise group (23.99 to 26.96) ($p < 0.001$).

The participants below and above 24 years showed significant increase within both yoga and Physical Exercise group.

Analysis of the Female and Male participants also showed significant increase within Yoga and Physical Exercise group.

The post assessment also indicated that there was no significant difference between the two groups.

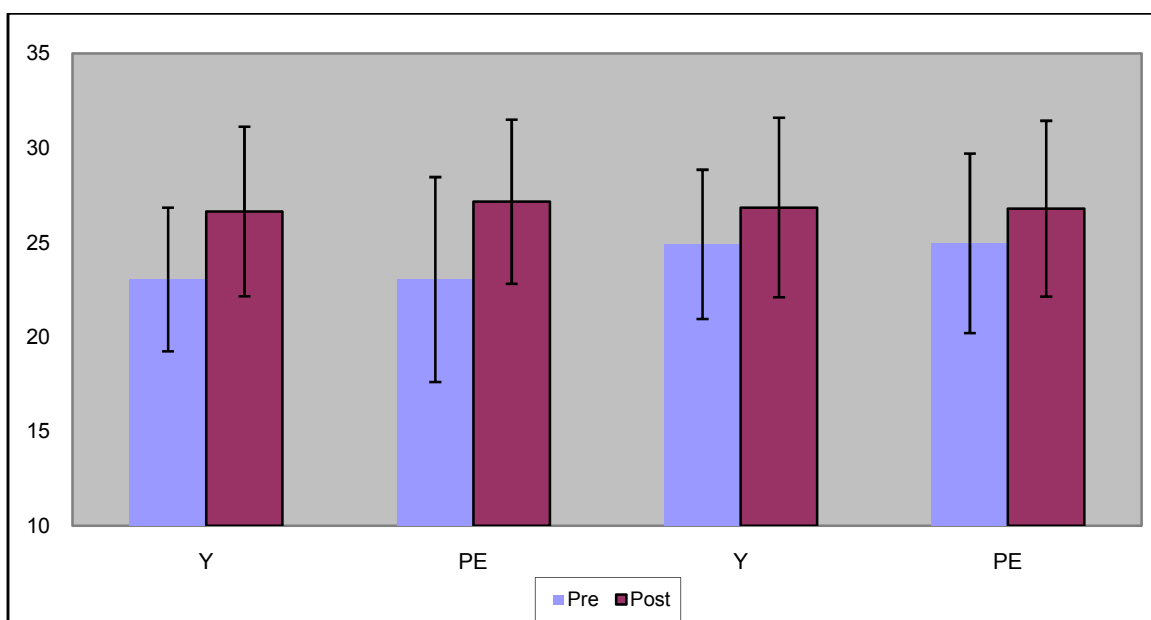
Figure 5.6.1 Mean \pm SD Descriptive statistics for SWLS



The pre-post scores on SWLS of the Yoga group indicated that there is improvement in the satisfaction level of the participants in the post assessment.

The Physical Exercise group also indicated better satisfaction in the post assessment.

Figure 5.6.1A Mean \pm SD Descriptive statistics for SWLS – Age wise



In age above and below 24 years, the pre-post scores on SWLS of the Yoga group indicated that there is improvement in the satisfaction of the participants in the post assessment.

The Physical Exercise group also indicated better satisfaction in the post assessment.

Figure 5.6.1B Mean \pm SD Descriptive statistics for SWLS – Gender wise

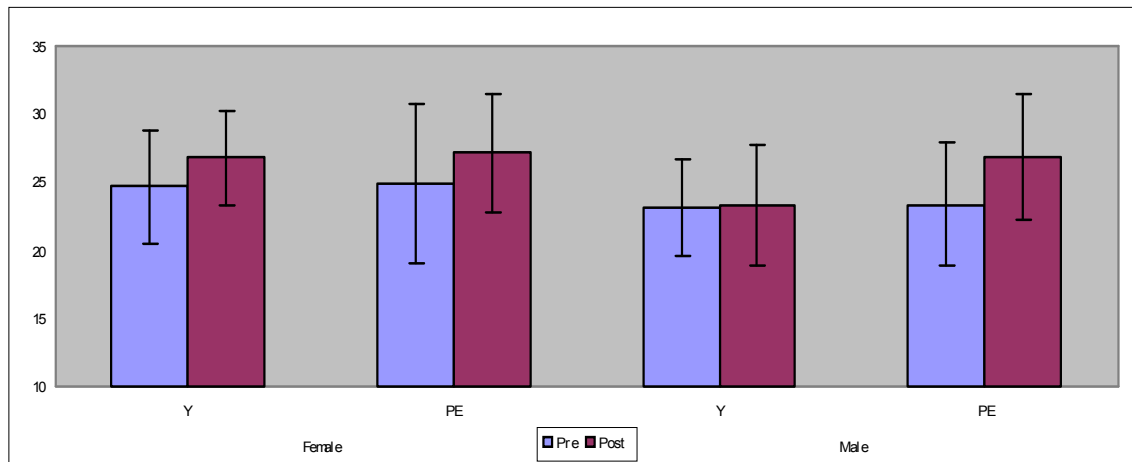


Figure 5.6.1B Mean \pm SD Descriptive statistics for SWLS – Gender wise

In both female and male groups, the pre-post scores on SWLS of the Yoga group indicated that there is improvement in the satisfaction of the participants in the post assessment.

The Physical Exercise group also indicated better satisfaction in the post assessment.

5.6.2 Comparison with Normative Data

Our study showed the group means of 23.80 for Y and 23.99 for PE group which after intervention jumped to 26.55 for Y and 26.96 for PE group which is nearer to the data for older Canadian people.

5.6.3 Improvement in Satisfaction with Life Scale -

Table 5.6.3 Improvements in Satisfaction in SWLS

| Scores | | Yoga | | PE | |
|---------|-------------------------|--------|-------|--------|-------|
| | | Before | After | Before | After |
| 5 – 9 | Extremely dissatisfied | - | - | - | - |
| 10 - 14 | Moderately dissatisfied | 1 | - | 2 | - |
| 15 – 19 | Slightly dissatisfied | 6 | 2 | 16 | 6 |
| 20 | Neutral | 10 | 1 | 4 | - |
| 21 - 25 | Slightly satisfied | 38 | 30 | 25 | 22 |
| 26 – 30 | Satisfied | 20 | 32 | 26 | 31 |
| 31- 35 | Extremely satisfied | 5 | 15 | 7 | 21 |

Table 5.6.3 shows that satisfied and extremely satisfied participants have increased in both Yoga & Physical Exercise groups whereas dissatisfied and neutral subjects have decreased considerably after intervention. .

5.6.4 - The question of interest was whether an individual’s satisfaction level changes after intervention. To ascertain this, two different McNemar’s tests were done to check the change from presence of dissatisfaction and satisfaction to its absence. Thus, the McNemar test was

done to ascertain the significance of shifts from dissatisfaction to before intervention, to satisfaction after intervention.

A cross-tabulation of the shifts for each group is presented in Table 5.6.3 and 5.6.4.

Table 5.6.3 – Cross-tabulation of satisfied and dissatisfied subjects before and after in Yoga

| | Group | | p value |
|---------------------|--------------------|-----------------|---------|
| | Dissatisfied after | Satisfied after | |
| Dissatisfied Before | 1 | 6 | 0.125 |
| Satisfied Before | 1 | 72 | |

Table 5.6.4 – Cross-tabulation of satisfied and dissatisfied subjects before and after in Physical

| | Exercise | | p value |
|---------------------|--------------------|-----------------|---------|
| | dissatisfied after | Satisfied after | |
| Dissatisfied Before | 5 | 13 | 0.002* |
| Satisfied Before | 1 | 61 | |

The cross-tabulation is to be interpreted as follows: In the Yoga group, 1 subject who was dissatisfied before remained so after intervention. 72 subjects who were satisfied remained so. 6 subjects who were dissatisfied before were satisfied afterwards. 1 subject satisfied before dissatisfied after. In the Physical Exercise group 5 subjects who were dissatisfied before remained so after intervention. 13 subjects who were dissatisfied before satisfied afterwards. 1 subject who was satisfied before dissatisfied afterwards. 61 subjects who were satisfied before were remained so after intervention.

6.00 DISCUSSION

This is a prospective randomized two armed control study for evaluating the effect of Yoga on “The Quality of Life”. The study was conducted on 184 healthy individuals. The age group was 30 ± 12.30 years for both male and female. This included 92 males and rest are females.

The observations were made for a period of eight weeks using (a) WHO QoL – 100, (b) The Vedic Personality Inventory (c) “The ‘G’ Inventory”, (d) Self-esteem (e) The Verbal Aggressive Scale and (f) Satisfaction with Life Scale.

The changes observed which were statistically significant are shown under ‘Results section’.

6.1 WHO QoL – 100

The study was conducted for a period of eight weeks on the basis of Integrated Yoga module which increased the quality of life in all seven domains which were similar to that of a standard physical exercise programme. All the domains under Yoga group experienced significant changes except Physical health and Level of Independence whereas, the domains at Physical exercise group had similar effect excepting physical health.

Even though no significant changes were found between groups, it was noticed that the positive effects were higher as for as spiritual and social relations were concerned in Yoga group

whereas in Physical exercise group, the higher level of improvement were noticed in Physical, Psychological, Level of Independence, and Social relations.

6.1.1 Global Health – Though there were no significant changes noticed within and between Yoga and Physical exercise group. The 'p' values reached significant levels in Yoga group and Physical exercise group in the age group ≤ 24 years and males in Yoga group.

6.1.2 Physical health – Yoga group and Physical exercise group had no noticeable change. We noticed significant change in the age group of > 24 years in Physical exercise group. In females, it was a significant change in Yoga and Physical exercise groups. The effect size was more in Physical exercise than Yoga group.

Sub analysis of the data – We found remarkable change in Physical exercise group in energy and fatigue reduction during facet wise analysis. This positive effect on Physical exercise in reducing energy and fatigue will add to the treasure of knowledge in respect Psycho Physiological benefits.

6.1.3 Psychological Health – Although there were no significant changes within and between groups in Yoga and Physical Exercise, the p values reached significant level ($p < 0.05$) in the age group ≤ 24 years, > 24 years, females and males in both Yoga and Physical Exercise. The effect size was more in Physical Exercise (0.52) than Yoga group (0.43).

Sub analysis of the data – As for as body image and appearance are concerned, Facet wise analysis could bring out good positive changes in Yoga and Physical exercise groups.

The facet of the psychological health is to determine negative effect if any. This has shown good results in Yoga group and has reduced negative effect. The physical exercise group has increased negative effect which is note worthy.

6.1.4 Level of Independence - Although there were no significant changes within and between groups in Yoga and Physical Exercise, the p values reached significant level ($p < 0.05$) in Physical

Exercise group in the age group of ≤ 24 years, >24 years, females and males. The effect size was more in Physical Exercise (0.32) than Yoga (0.05) groups.

Sub analysis of the data – There was significant change in Yoga and Physical exercise groups on activities of daily living as far as facet wise analysis is concerned. The experiment shows a good result on medication dependence or medication and treatment has reduced.

6.1.5 Social Relations - Although there were no significant changes within and between groups in Yoga and Physical Exercise, the p values reached significant level ($p < 0.05$) in Physical Exercise group in the age group >24 years, females and males. The effect size was same in both Yoga and Physical Exercise group.

6.1.6 Environmental Health - Although there were no significant changes within and between groups in Yoga and Physical Exercise, the p values reached significant level ($p < 0.05$) in both Yoga and Physical Exercise group and in all domains except in the age group of >24 years and females in Yoga group. The effect size was more in Physical Exercise (0.47) than Yoga (0.45).

Sub analysis of the data – Facet which includes physical safety and security, home environment, financial resources, health and social care: accessibility and quality, opportunities for acquiring new information and skills, participation in and opportunities for recreation/leisure activities, physical environment (pollution, noise, traffic climate), transportation showed significant difference in both Yoga and Physical Exercise groups.

6.1.7 Spiritual Health - Although there were no significant changes within and between groups in Yoga and Physical Exercise, the p values reached significant level ($p < 0.05$) in both Yoga and Physical Exercise groups and in all domains of spiritual health except age group >24 years and females in Yoga group. The effect size was more in Yoga (0.36) than Physical Exercise (0.30).

6.1.8 General Analysis: Gender analysis showed differences in Yoga and Physical Exercise group. Under female category, significant changes observed in Yoga group are Psychological health and in Physical Exercise group is Global health, Physical health, Psychological health, Environmental health and Spiritual health. In male category significant changes observed in Yoga group is Global health, Psychological health, Environmental health and Spiritual health whereas Psychological health, Level of Independence, Environmental health and Spiritual health in Physical exercise Groups.

Age analysis showed difference between two age groups (≤ 24 years & > 24 years). The age group ≤ 24 years showed better changes than the age group > 24 years after eight weeks of intervention in both Yoga & Physical Exercise groups. In younger groups most significant changes observed in Yoga group is Global health, Psychological health, Environmental health and Spiritual health whereas Psychological health, Level of Independence, Environmental health and Spiritual health in Physical Exercise Group. In older groups significant change observed in Yoga group was Psychological health and in Physical Exercise was Physical health, Psychological health and Social relations and Environmental health.

The baseline scores of different domains in normal adults of Bangalore (present study) with (Chennai and New Delhi) were compared with other countries (Melbourne, Paris & Tokyo). The scores of Indian origin match with that of the persons at Melbourne in almost all domains.. This may be because we have taken data for normal healthy volunteers.

The greater degree of improvement in two facets of Physical Health ('pain and discomfort' and 'energy and fatigue') in the Physical Exercise than Y group is noteworthy. This positive effect of Physical Exercise adds to the fund of knowledge about several psycho physiological benefits of Physical Exercise.

Relatively higher effect size in the Yoga group than Physical Exercise in spiritual domain that includes spirituality/religion/personal beliefs is noteworthy.

6.2 The Vedic Personality Inventory

6.3 “The ‘G’ Inventory” (GIN)

This study has demonstrated that an 8 weeks intervention of an integrated yoga module improved *Guṇās*.

In the Yoga group subjects who were predominantly of non-*Sattva* type before intervention, to *Sattva* type after intervention. The same was done for non-*Rajas* to *Rajas* and non-*Tamas* to *Tamas* types.

The *Guṇās* were further investigated using The Vedic personality Inventory (VPI). The results showed that there was increase in *Sattva* in both groups and decrease in *Rajas* ($p=0.002$) and *Tamas* in the Physical Exercise group. The scores for *Tamas* decreased significantly in seniors of both the groups. Females in Yoga group and males in Physical Exercise group also showed significant difference. The increase in *Sattva* in Yoga group was higher (effect size 0.61) than PE group (effect size 0.45). Decrease in *rajas* was significantly higher in Physical Exercise than Yoga group and this was seen in juniors and males.

The upward trend in the central tendency of the scores on “The ‘G’ Inventory” seems to be quite consistent with the *Gita* concept that initially the *Guṇās* vary in their dominance in determining the personality of an individual (canto 14), (Prabhupada ACBS, 1976) and gradually and ultimately, though very slowly, through a sort of moral evolution moves from *Tamas* and *Rajas* to *Sattva* and finally goes beyond the *guṇās* and attains liberation (cantos 7 & 14). (Prabhupada ACBS, 1986). This trend of shift towards increase in *Sattva* and decrease in *Tamas* after eight weeks of integrated yoga practices and not after Physical Exercise is well demonstrated in this study.

Thus we can see that although both *Rajas and Tamas* have both positive and negative qualities, these are the manifestation of a violent state of mind in which person lacks mastery over upsurges of emotions and impulsive behaviour (Nagendra HR, 2003). Most of the qualities of *Sattva* that are the manifestation of a calm state of mind is achievable by different yoga techniques (physical postures, *pranayama*, and/or meditation) meant for mastery over mind-body complex (Holt WR, Caruso JL, Riley JB, 1978). Several earlier studies have independently corroborated this. It has been shown that self-esteem, sense of control and determination improved after meditation (Alexander CN, Robinson P, Rainforth M, 1994). Reduction in crime rate after TM supported the effect of a calm state of mind on social health (Abrams AI, 1979). These positive effects also show up as better perception and memory as well as better motor performance (dexterity and coordination tests) (Dillbeck MC, Orme-Johnson DW, 1987). Better academic performance has all been documented (Kember P. 1985). *Rajas and Tamas* are said to be the manifestation of a violent state of mind in which person lacks mastery over upsurges of emotions and impulsive behaviour. Yoga is known to be useful in promoting positive health at physical, mental, social, emotional and spiritual domains which results in becoming energetic, self confident, mastery over sense organs, harmony and coordination between right and left brain functions and free from stresses and lively. These are attributed to the calmness of mind leading to forbearance and stability of the nervous system (Pathak NS, Bhatt ID, Sharma R, 1992) that is the qualities of a *Sattva* dominant person.

A similar study by Dasa DG (Dasa DG, 1999) conducted by the use of *mahamantra* (chanting of a specific pious chant) in a 3-armed randomized prospective control study on 62 volunteers showed that the *mahamantra* group had increased *Sattva* and decreased *Tamas* with no significant change in *Rajas* scores using Vedic Personality Inventory that is also a measure of the three *Guṇās*. In their study they also showed a significant reduction in stress, anxiety and depression after a month of chanting of *mahamantra*, 20 minutes daily for 4 weeks.

Comparatively the present study also has demonstrated a significant improvement in *Sattva* and *Tamas* scores. In addition, the present study has also revealed reduction in *Rajas* in females and seniors that was not found in their study. This difference would be because of the inclusion of *Asanas* and *Pranayama* in addition to the meditation technique in the present study whereas the *mahamantra* study was mainly a form of meditation.

Although in this study, Yoga has shown better effect on *Sattva Guṇā* than Physical Exercise with a better effect size, the main difference between Yoga and Physical Exercise practices seems to be the effect on *Rajas Guṇā*. The reduction in this *Guṇā* was significantly higher in Physical Exercise than Yoga (this group difference was in males and juniors). The scores for *Tamas* also decreased significantly in seniors of both groups (females in Yoga group and males in Physical Exercise group) with the effect size being higher in Physical Exercise than Yoga group. Thus significantly greater reduction in *Rajas* and *Tamas* in the Physical Exercise than Yoga group is noteworthy. This positive effect of Physical Exercise in reducing *Rajas* and *Tamas* adds to the fund of knowledge about several psycho physiological benefits of Physical Exercise. Hence it appears that to reduce the limitations of *Rajas* and *Tamas*, such as lack of mastery over upsurges of emotions and impulsive behavior, physical practices are more effective and Yoga improves the softer qualities of *Sattva*. The mechanism of how the physical exercises may reduce the *Rajas* and *Tamas* and Yoga may increase *Sattva* needs to be investigated by further studies. Thus we may conclude that both physical activity (to reduce *Rajas* and *Tamas*) and Yoga (to improve *Sattva*) may be recommended for the harmonious promotion of personality.

6.4 Self-Esteem

6.4.1 Competency (COM) – The Physical Exercise group and juniors in Physical Exercise group showed significant increase. Competence means ability to evaluate and understand one's personal resources. This feeling reflects esteem based on the skills, talents and unique achievements.

6.4.2 Global Self Esteem (GSE) – Yoga group showed a significant increase in Global Self-Esteem. Seniors and females also showed significance increase in Yoga group. Global Self-Esteem is the general appraisal of the self and it is based on adolescent's evolution of all parts of himself.

6.4.3 Moral and Self-Esteem (MSE) – The same trend like Global Self Esteem noticed in Moral and Self-Esteem also. Moral and Self-Esteem is the reflection of feeling good as being honest, sincere, adhering to social values etc.,

6.4.4 Social Self -Esteem (SSE) – Senior and females showed significant increase in Yoga group. Social esteem encompasses the adolescents feeling about himself as a friend to others.

6.4.5 Family Self – Esteem (FSE) – A significant increase noticed in seniors and females in Yoga group. Family Self – Esteem reflects his feeling about himself as a member of his family.

6.4.6 Body and physical appearance (BPA) – A significant improvement is noticed in Yoga group. In the Physical Exercise group juniors and males have shown a significant improvement. Body and physical appearance is the body image as a contribution of physical appearance and capabilities.

Yoga group showed a significant increase in Global self-esteem (GSE), Moral and self-esteem (MSE), Body and physical appearance (BPA) whereas Physical Exercise had shown significant increase in only one sub scale of self-esteem i.e., Competency (COM). Though there is a statistically significant difference in the mean scores of these parameters before and after intervention for both the groups, The effect sizes were clearly larger for the group that did yoga.

An analysis based on gender showed the differences in Yoga and Physical Exercise groups. Under the female category, significant changes observed in Yoga group are Global Self-Esteem, Moral and Self-Esteem, Social Self-esteem and Family self-esteem and in Physical Exercise group was Competency. In the male category a significant changes observed was in Body and physical appearance in Physical Exercise Group. Age analysis showed difference within the two age groups (≤ 24 years & > 24 years). The older group showed better changes than the younger group in Yoga. In the younger group most significant changes observed in Physical Exercise were Competency, Body and Physical Appearance. In the older group significant changes observed in Yoga group was Global Self -Esteem, Moral and Self-esteem, Social Self-esteem and Family Self-esteem..

Relatively better changes in the Yoga group (compared to Physical Exercise group) in Global Self-esteem (general appraisal of the self, based on one's evolution of all parts of himself), Moral and Self-esteem (which is the reflection of feeling good as being honest, sincere, adhering to social values etc.,) domains are noteworthy. Practice of breathing exercises, *pranayama* and the systematic breathing during *asanas* regularises the breathing mechanism, trains the proper use of abdominal and chest muscles and also improves the vital capacity and stamina which in turn can influence better self-esteem (Nagendra HR, Nagarathna R. 1983). Yogic breathing exercises positively affect mood and they have clinical potential as a self-control technique for improving and stabilizing affective states (Harvey JR, 1983).

Competency (ability to evaluate and understand one's personal resources), Body and Physical Appearance (body image as a contribution of physical appearance and capabilities) in younger groups and Body and Physical Appearance in males were significantly better in Physical Exercise group. This positive effect of Physical Exercise in improving Competency and Body and

Physical Appearance adds to the fund of knowledge about several psycho physiological benefits of Physical Exercise.

6.5 The Verbal Aggressiveness Scale

This study has demonstrated that an eight weeks intervention of an integrated yoga module decreased verbal aggressiveness in yoga group with a non-significant increase in the Physical Exercise group. RMANOVA for interactions of change scores showed no significant difference between genders and age groups in either yoga or Physical exercise groups.

A comparison of the base line scores of VAS used in another study by Wolf DB (used to validate the *Rajas* domain of another questionnaire called Vedic personality inventory) showed that the means of the baseline scores (59.23 ± 8.44) of our study group ($n=173$) are comparable to their population ($n=240$) in USA (56.04 ± 17.08) (Wolf DB, 1998).

A study on the relationship between verbal aggressiveness and state anxiety in sport setting by Alexandra et al (Bekiari A, Pantazis S, Apostolou M, Nonnati A, Sakellariou K, 2005), showed that male basketball players were more affected from verbal aggressiveness of their coaches compared to female basketball players as assessed by VAS administered immediately after the game. In their study they also have observed that the male players showed a positive correlation between their anxieties with VAS scores. It is known that yoga with its holistic approach uses several techniques to calm down the mind and reduces the anxiety state. Earlier studies at SVYASA have shown that in community home girls and the congenitally blind children, the sympathetic tone reduced after yoga practices which resulted in significant decrease in resting heart rate and breath rate thus reducing fear and anxiety (Telles S, Narendran S, Raghuraj P, Nagarathna R, Nagendra HR, 1997). Another study on healthy PT teachers also has shown that yoga reduced their sympathetic activity after three months of practice (Telles S, Nagarathna R, Nagendra HR, Desiraju T, 1993). In patients with anxiety neurosis (Sahasi G, Mohan D, Kacker C,

1989) a significant reduction in anxiety scores were observed after yoga program. Based on these observations, we may suggest that the reduction in the aggressiveness in the present study could be due to the reduction in their baseline anxiety and sympathetic reactivity.

The rate of violent victimization among 12 to 24 year olds is nearly twice as high as that among adults 25 and over (Bureau of Justice Statistics, 1996). In the present study the changes observed in VAS after yoga practices is an evidence to recommend the use of yoga for reduction of violence.

According to the most widely used scriptural reference on yoga, sage *Patañjali* (Taimini IK, 1999) defines yoga as a technique for developing mastery over the modifications of the mind and goes on to highlight many techniques that help in achieving this mastery. They are classified under eight major streams including injunctions for social and personal behaviour (Yama Niyama), body postures (*āsanas*), breathing (*Prāṇāyama*) and meditation (*Pratyāhāra*, *Dhāraṇa*, *Dhyāna* and *Samādhi*) techniques that lead to mastery over any of the modifications in the mind. Further, sage *Vaśiṣṭha* (Nagarathna R, Nagendra HR, 2003) in his famous work (*yoga Vaśiṣṭha*) defines yoga as a technique to slow down or calm down the mind directly through deep internal awareness. Hence it was hypothesized that Verbal aggressiveness, one of the manifestations of an uncontrolled fast mind, can reduce through these techniques of yoga.

In summary, this randomized prospective comparative study has shown the efficacy of Yoga in decreasing verbal aggressiveness. Thus this randomized control study has proven the alternative hypothesis that eight weeks of practice of yoga is as effective as physical exercises in normal healthy volunteers. Hence, this benefit yoga may be recommended in schools since the problem of violence amongst students is still a live issue in all parts of the world.

6.6 Satisfaction with Life Scale (SWLS)

This is a randomized control prospective study in normal adults comparing the efficacy of Yoga with a Physical Exercise group. This study has demonstrated that an eight weeks intervention of an integrated yoga module improved life satisfaction per se Quality of Life.

Considerable variability in life satisfaction as reported on the SWLS has been observed between and within a number of diverse populations. The group means vary from approximately 12 for an alcoholic inpatient sample to 28 for a group of older Canadians. In terms of the means observed, most groups fall in the range of 23 to 28 or the range of slightly satisfied to satisfied. Our study scores also fall in the range of 23.80 (Yoga) and 23.99 (Physical Exercise) group, which increased, to 26.55 (Yoga) and 26.96 (Physical Exercise) after intervention. This level of satisfaction is in good agreement with the frequent finding that in Western countries a preponderance of respondents reports well-being about the neutral point on a variety of measures (Andrews and Withey). On measure of unpleasant affect, such as the Beck Depression Inventory, most individuals in non-clinical samples score at the low end, producing a highly skewed distribution in which only a few individuals are depressed. Thus, the means on the SWLS, which fall in the slightly satisfied to satisfied range for most groups, appear to reflect the widely replicated finding that non-clinical samples are above the neutral point in subjective well being (SWB).

SWLS was an instrument used in The Vedic Personality Inventory (VPI) to measure convergent construct validity, as there were no reliability studies on these instruments. It was hypothesized to correlate with *Sattva*.

The SWLS provides an adjunct to measures oriented towards the assessment of negative states. It assesses the positive side of the individual's experience rather than focusing on unpleasant emotions. In making a life satisfaction judgment, the SWLS emphasizes the person's own

standards of evaluation. The findings reveal that SWLS has increased in both Yoga and Physical Exercise groups.

Satisfied and extremely satisfied subjects have increased in both Yoga and Physical Exercise groups whereas dissatisfied and neutral subjects have decreased after intervention.

Subjective Well Being (SWB) is one measure of the quality of life of an individual and societies. Philosophers have debated the nature of the life for millennia, and one conclusion that has emerged from this debate is that the good life is happy. We consider positive subjective well being to be necessary for the good society. A person or society that has high subjective well being, however, might still be missing an ingredient such as fairness, which people might consider to be essential to a high quality of life, working from the philosophical notion of utility, suggested that subjective well being is one of three major ways to assess the quality of life of societies, along with economic and social indicators. Because of multi advantages, yoga can be an adjunct to measure and increase subjective well being of human beings as well as society.

In summary, this randomized prospective single blind interventional study has shown the efficacy of both Yoga and Physical Exercise in improving the satisfaction level.

सुमारय

Yoga and Physical Exercise have been evaluated as separate interventions for normal healthy volunteer participants in this study. There have been significant benefits following the introduction of Yoga in normal healthy volunteer participants. The improvements were in diverse areas such as Quality of Life, *Guṇās*, self-esteem. Hence it provides scientific evidence to consider Yoga as a beneficial alternative or add-on programme to Physical Exercise

However, it is essential to keep in mind that the study was conducted on normal healthy volunteers in different locations. It would make the present study quite different when compared to conducting classes at a single place. This also suggests areas for future research.

Applications of this study

This randomized prospective single blind comparative study has shown the efficacy of both Yoga and Physical Exercise in improving all components of general health. While the physical exercise practice has reduced *Rajas* and *Tamas*, the yogic practice has increased *Sattva*. Hence, yoga, which is traditionally acceptable in India and cost effective, can be recommended with additional benefits of promotion of *Sattva guṇā*.

As Yoga has helped in decreasing verbal aggressiveness it may be recommended in schools since the problem of violence amongst students is still a live issue in all parts of the world.

These findings reveal that Yoga can also influence the Quality of Life similar to Physical exercise programme. Hence it can be considered independently to promote Quality of Life, prevention of chronic diseases, health promotion and socio-economic development

CONCLUSIONS

1. Quality of Life improved after both yoga and Physical Exercise. Higher effect sizes (non-significant) after yoga in Spiritual health and Social relations and in Physical health, Psychological health, Level of Independence, Social relations, Global health and Environmental domains after Physical Exercise.

2. Yoga group increased *Sattva* and reduced *Tamas*. Physical Exercise group reduced *Rajas*.
There was a significant difference between the groups in *Rajas*.
3. Yoga helped in shifting from non *Sattva* to *Sattva* and *Tamas* to Non *Tamas*.
4. Self esteem-Yoga improved Global, Moral and Body and physical appearance. Physical Exercise improved Competency.
5. There was a significant decrease in verbal aggressiveness in Y group with a non-significant increase in the Physical Exercise group.
6. Satisfaction with Life increased and dissatisfaction decreased after both Yoga and Physical exercise.
7. The concept of “Quality of life” in yoga and spiritual lore takes into consideration the holistic perspective of an individual.

LIMITATIONS OF THE STUDY

Limitations of the study were

- (a) This could not be a blinded RCT since yoga is a self-corrective learning process.
- (b) Although we ensured that both groups had not done any yoga practices before recruitment, the possibility that the control group participants may have been exposed earlier to the concepts and philosophy of yoga (as it is widely available in the media in Indian culture) could not be ruled out.
- (c) Although significant, the difference found after 8 weeks of intervention was small and hence we may argue whether it is worth recommending an hour of practice daily in the busy 21st century life style. It may be stated that continued longer durations of practice might show greater degree of changes. This was noticed in Asthma and Schizophrenia project, where, shorter intervention could not give any significance but when the intervention was increased, yoga showed greater significance (Nagarathna R, Nagendra HR, 1985). Further, a justification would be the potential for other health benefits with yoga (such as on blood pressure, well being etc) and the complications and costs associated with drug therapy. Future studies are required to study the physiological indicators of anxiety that may correlate with VAS. Also a third arm with only the lectures for education may be included in future studies.
- (d) The study was conducted on normal healthy volunteers in five different places of Bangalore City. Randomisation was basically a problem as all the volunteers preferred to be in yoga group than physical exercise. Hence, there was considerable number of dropouts.
- (e) The other limitation of the study was basically eight weeks of practice. If the practice had been six months, there would have been better results as was seen in the earlier studies.
- (f) In the present study only psychological parameters were studied.

STRENGTHS

The strength of this study is the good sample size and the design in which the control group also had the same duration of interaction with the instructor and learnt non-yogic physical practices comparable to the integrated Yoga module. And the study population was taken from different parts of Bangalore from different socio-economic classes of the city.

This study is the first randomized control trial which has evaluated “Quality of Life” using Yoga and physical exercise as interventions in normal healthy volunteers taking into account a wide range of variables such as (i) “Quality of Life” (ii) *Guṇās* (iii) self-esteem, (iv) verbal aggressive scale and (v) general health. Also, the assessments were made before and after eight weeks of the respective interventions, allowing for a longitudinal follow-up and evaluation of progression in any changes seen.

POSSIBLE AREAS OF FUTURE RESEARCH

As mentioned above, the present randomized control trial evaluated Yoga and physical exercise for the promotion of “Quality of Life”, *guṇās*, Self-esteem and positive health in normal healthy volunteers who were living in 5 different places of Bangalore city. Though the trial did demonstrate several benefits with Yoga and physical exercise, it would be desirable to evaluate the benefits by these interventions in a single place.

The duration of the interventions to be increased to six to twelve months for better results that was noticed in Asthma and Schizophrenia project, where, shorter intervention could not give any significance but when the intervention was increased, yoga showed greater significance.

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