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Implications of Corporate Yoga: A Review

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1. Introduction

Yoga is an art of life management and a universal means for self realization. Health benefits and improvement of human intelligence are inseparable byproducts of yoga practices that can be achieved by every practitioner. Aurobindo (1999) defines yoga as "a practical discipline incorporating a wide variety of practices whose goal is the development of a state of mental and physical health, well-being, inner harmony and ultimately a union of the human individual with the universal and transcendent existence". Yoga is an ancient discipline designed to bring balance and health to the physical, mental, emotional, and spiritual dimensions of the individual (Iyengar, 1976). In contemporary scenario, a part of oriental wisdom, yoga has been widely known even in western countries and a substantial number of people have been practicing it for different purposes such as physical fitness, flexibility, stress management, psychological well being, emotional rectification, good habits cultivation and disease management as adjunct therapy. Only USA invests 5.7 billion US dollars annually for yoga classes and yoga products (Macy, 2008). A substantial number of women have been found practicing yoga in UK and other countries. The emergence of many more yoga studios in Europe and South Asia and research studies made pertaining diverse efficacies of yoga portray its ascending popularity and scientific validation and standardization by scientific community.

At present, there are number of scientific researches that substantiate preventive, rehabilitative, therapeutic and excelling powers of yoga at individual and corporate levels (Becker, 2000; Jacobs, 2001; Khalsa, 2004; Ornish, 2009). One of the most exciting developments in the last few decades is the cross fertilization of western science with ideas from Eastern wisdom system such as yoga. With increasing precision, scientists are able to look at the body, mind and spirit and detect the sometime subtle changes than practitioners of yoga and meditation undergo. A scientific interpretation of yogic effects has been made on the basis of bio-psycho-socio-spiritual research model (Evans et al., 2009).

On the other hand, a flood of chronic diseases (cardiac problems, diabetes, cancer, lower back pain, obesity, depression etc.) (World Economic Forum [WEF], 2010, p. 9), organizational misbehaviors (work place incivility, insidious and insulting behaviors, social undermining, theft of company assets, acts of destructiveness, vandalism and sabotage, substance abuse and misconduct perpetrated against fellow employees) (Fox & Spector, 2005), interpersonal conflict/work-life conflict and dearth of spiritual leadership have been met as the precursors for global recessions and workplace disharmony. Therefore, most of the today's successful companies of the world have prioritized workplace yoga/spirituality as an emerging avenue for corporate- wellness (CW) and excellence (CE).

"The business of business and business of life are one. The reason for living and working is to act and the reason to act is to seek excellence in everything that you do" (Sinclair, n.d, as cited in Pruzen & Pruzan, 2001). This quotation from a CEO and chairman of a leading company (Tan Range Exploration, Ltd., USA/Tanzania) portrays the relevance of spiritual insight for business management and performance excellence. Persistent practice of yoga and allied disciplines as a part of corporate culture improves somatic, psychic, social and spiritual health and intelligence of an individual and organizational workforce.

Additionally, levels of four human intelligences- spiritual (SI), emotional (EI), creative (CI) and rational (RI), acquired by an individual govern his/her way of feeling, thinking and behavior and undoubtedly can be regarded as the determiners of human personality and human excellence too. Optimal health (physical, mental, social and spiritual) and the four elements of intelligence (SI, EI, CI and RI) that can be acquired and sustained by prolonged yoga practices underpin individual or CW and CE.

Health problems- stress or distress, obesity, low backache, respiratory disorders, cardiovascular problems, digestive disorders and genitourinary disorders are prevalent at corporate world and cause a huge decline in the corporate health and wealth. On the other hand, regular yoga practice is found more helpful for total health promotion, disease prevention and rehabilitation as well. Particularly, yoga has been found effective to manage work related stress, respiratory disorders (asthma, pulmonary tuberculosis, pleural effusion, obstructive pulmonary diseases, chronic bronchitis), cardiovascular disorders (ischemic heart disease, coronary artery disease, angina, chronic heart failure, hypertension), digestive disorders (irritable bowel syndrome, hyperacidity, colitis, indigestion, diabetes, gastroesophageal reflux disease, hepatitis, gall stones, celiac disease) and genitourinary problems (urinary stress incontinence, women sexuality, climacteric syndrome, premature ejaculation, pregnancy outcomes, labor pain and duration). Thus, this writing is contained with sub-headings that describe the efficacy of CY to manage aforesaid health problems.

Being a secular, global, holistic and cost effective tool for boosting holistic health and awakening four faculties of human intelligence, yoga needs to include as a part of corporate culture along with scientific researches to substantiate its multidimensional efficacies. So the prime theme of this chapter is to highlight contemporary significance of corporate yoga (CY) to enrich health, happiness and harmony at workplace by promoting CW and CE. More specifically, the chapter is intended to argue-

1. The concept and contemporary significance of CY
2. Link among yoga, health care and four human intelligences
3. Efficacy of yoga for CW and CE
4. Preventive and therapeutic value of yoga relating to work related stress, respiratory disorders, cardiovascular disorders, digestive disorders and genitourinary disorders.

2. Contemporary significance of CY

Sages of yore have argued eternal significance of yoga for the welfare of entire mankind and global harmony**.** Same has been reinstated by contemporary enlightened masters such as Shriram Sharma Acharya, Swami Vivekananda, Maharishi Aurovindo, Swami Shivanand and Swami Rama so forth on the basis of their experiential and experimental knowledge. The father of scientific spirituality, Shriram Sharma Acharya defines yoga as "an art of living". This contemporized definition of yoga implies that yoga is nearer to life business or management. Correspondingly, business of business and business of life are one and the reason for living and working is to seek excellence in everything that we do (Sinclair, n.d, as cited in Pruzen & Pruzan, 2001). Interestingly, this indicates art of self business (yoga) as a foundation of sustainable corporate business and success. This substantiates the contemporary significance of CY for CW and CE. The contemporary significance of CY for corporate success can be concisely discussed in three sub heads- concept, popularity and health impacts of yoga for the ease of readers' comprehension.

2.1 Concept of Yoga

Yoga is a Sanskrit word that means union, to yoke or to unify; the merging of the microcosm of our existence in our body with the macrocosm. In other words, this also implies the fusion of embodied consciousness with cosmic consciousness (Chaoul & Cohen, 2010). The famous yoga exponent, sage Patanjali defines the yoga as "the inhibition of psychic modifications (Patanjali Yoga Sutra, 1:2)" that ultimately results in the fission of *Prakriti* (the equilibrium condition of three strands- *sat, raj* and *tam* that is eternal but changeable) and *Purusha* (pure consciousness that is immortal, eternal, omnipresent, omniscience and omnipotent). The next famous ancient text of yoga, Shrimad Bhagvat Geeta (SBG) defines the yoga as "a state of mental equanimity at each moment of the life" (SBG, 2:47). Subsequently, SBG also defines yoga from the behavioral perspective as "the excellence in action" (SBG, 2:48). In the West, yoga is often referred to as a mind-body technique from Asia, usually categorized as meditation (for those seated practices) and yoga (practices that include movement and the active participation of the body) (Chaoul & Cohen, 2010). Thus, yoga is perceived as an overarching category that includes all Asian mind-body practices, whether from India (Hatha yoga, etc.), Tibet (Tsa lung Trul khor [rTsa rlung 'Phrul 'khor]), China (T'ai chi, qi gong) or other Asian origin. Nonetheless, in Indian context, yoga is more than mind-body practices that also incorporates spiritual practices.

Basically, four major streams of yoga: *Karma Yoga* (The yogic path of undertaking selfless deeds by using attained wisdom, power and prosperity), *Bhakti Yoga* (The yogic path of devotion), *Jnana Yoga* (The yogic path that prioritizes rational thinking over knowledge), and *Raj Yoga* (The eightfold yogic path synthesized by sage Patanjali 5000 years ago) can be met in Indian classical texts. However, Raj Yoga as conceptualized by sage Patanjali is supposed to have synthesized all yogic paths as a garland. It has metaphorically comprised of eight subsequent limbs (a tree of eight limbs): *Yama* (universal ethics/social codes), *Niyama* (individual ethics), *Asana* (physical postures), *Pranayama* (breath control), *Pratyahara* (control of the senses), *Dharana* (concentration), *Dhyan* (meditation), and S*amadhi* (bliss). Indeed, this path of *Raj Yoga* is an integral form of *Karma Yoga*, *Bhakti Yoga*, and *Jnana Yoga* that can be adopted by any individual for total health and ascetic elevation (spiritual advancement). Correspondingly, Satyanand (2000) argued that from the perspective of yoga

psychology (*Raj Yoga)*, human personality can be categorized into four types: dynamic, emotive, rational and volitional (p. 16).

Karma Yoga is preferred yogic path for an individual with active personality who can traverse inner journey of psychic refinement through selfless deeds. An individual with emotive personality may love *Ishwarparnidhan* (*Bhakti Yoga*) for psychic refinement and subsequently inhibition of psychic modifications. The path of *Jnana Yoga* is an optimal yogic way that prioritized by rational personalities. Eminent yoga scholar and seer, Patanjali put forth *Raj Yoga* (the royal path of yoga) that is equally applicable to each aspirant desired for perfect health, happiness, harmony, and ultimate bliss. Obviously, that is an integral and concise yogic way for all possible personalities.

2.2 Popularity of Yoga

Popularity of yoga practice in the West is in ascending order since 1960 and particularly in UK, where yoga classes are open to everyone although women tend to make up 70 to 90 per cent of the student base of most classes as well as the majority of yoga teachers (Newcombe, 2007). Moreover, perceived better physical health and emotional well-being by the yoga practice is an important reason for women's more participation in the classes. Additionally, yoga also served as an important support for women becoming more aware of feelings of alienation from traditional biomedical practitioners. "Only US invest $5.7 billion dollars per year in yoga classes by involving 15.8 million people. Among US yoga practitioners, 72.2 percent are women who practice yoga to be slim, flexible, de-stressed and attractive (Macy, 2008). In a national population-based telephone survey (n = 2055), 3.8% of respondents reported using yoga in the previous year and cited wellness (64%) and specific health conditions (48%) as the motivation for doing yoga (Saper et al., 2004). In South Asian countries, everyone has craze for yoga and yoga has greater space in corporate circles too. Turnover of yoga business in Asia is more than 50 crore per year and a large number of corporate personnel are being trained in yogic ways of stress management and mind management in Pure Yoga Studio of the Hong Kong (Singh, 2009). Moreover, the rise of yoga masters like Swami Ramdev has promoted mass media communication of yoga worldwide.

2.3 Yoga versus health

A famous yoga exponent of contemporary time, Aurobindo (1999) defines yoga as "a practical discipline incorporating a wide variety of practices whose goal is the development of a state of mental and physical health, well-being, inner harmony and ultimately a union of the human individual with the universal and transcendent existence". Iyengar (1976) defines yoga as an ancient discipline designed to bring balance and health to the physical, mental, emotional, and spiritual dimensions of the individual. These two definitions of the yoga given by Aurobindo and Iyengar clearly hint its bio-psycho-socio-spiritual efficacy for attainment and maintenance of total health (physical, mental, social and spiritual health) as an elementary benefit and a byproduct if practiced persistently.

The *Hatha Yoga* is widely known in the present scenario, especially in the west, is supposed to be an elementary practice for the practice of *Raj Yoga* which includes body cleansing techniques (*Shatkarmas*), postural exercises (*Asanas*), gestures (*Mudras*), psychic locks (*Bandhas*), breath control (*Pranayama*), concentration (*Dharana*) and meditation (*Dhyana*).

Yoga practice consists of the five-principles including proper relaxation, proper exercise, proper breathing, proper diet, positive thinking and meditation (Chanavirut, Khaidjapho, Jaree & Pongnaratorn, 2006). Impacts of yoga practices can be better explained via bio-psycho-socio-spiritual model- at physical level it improves musculoskeletal functioning, cardiopulmonary status, autonomic nervous system (ANS) response and endocrine functioning; at psychosocial level, it enhances self-esteem, social support and positive mood; and at spiritual level it elevates compassionate understanding and mindfulness (Evans et al., 2009). Same hypothesis is supported as "well-rounded yoga practice may have benefits on structural, physiological, psycho-emotional and spiritual levels" (Herrick & Ainsworth, 2000).

Mechanisms underlying the modulating effects of yogic cognitive-behavioral practices (e.g., meditation, *Asanas*, *Pranayama*, caloric restriction) on human physiology can be classified into four transduction pathways: humoral factors, nervous system activity, cell trafficking, and bio-electromagnetism that shed light how yogic practices might optimize health, delay aging, and ameliorate chronic illness and stress from disability (illness and stress from disability) (Kuntsevich, Bushell, &Theise, 2010). Moreover, they provided standpoints for in-depth study of underlying mechanisms by postulating three possible hypotheses regarding mechanisms of yogic effects. Correspondingly, yogic practices may: 1) promote restoration of physiologic setpoints to normal after derangements secondary to disease or injury, 2) promote homeostatic negative feedback loops over non-homeostatic positive feedback loops in molecular and cellular interactions, and 3) quench abnormal ''noise'' in cellular and molecular signaling networks arising from environmental or internal stress. The detailed elaboration of the proposed hypotheses is beyond the scope of this writing unless it is quite intriguing and comprehensive that includes all possible modes of varied yogic effects (effects of *Asana*s, *Pranayams*, varieties of meditations and caloric restriction) till now.

It is claimed that these techniques bring an individual to a state of perfect health, stillness and heightened awareness by increasing the body's store of *prana*, or flow of vital energy (Kulkarni & Bera, 2009; Nayak & Shankar, 2004).Other claimed benefits of regular yoga practice leads to suppleness, muscular strength, feelings of well-being, reduction of sympathetic drive, pain control and longevity (Brown & Gerbarg, 2009; Garfinkel & Schumacher, 2000; Lipton, 2008). Yogic breathing exercises allegedly reduce muscular spasms and expand available lung capacity (Brown & Gerbarg, 2005).Yoga is thus advocated as a symptomatic treatment for a wide range of conditions, including anxiety, arthritis, back pain, cardiovascular problems, gastrointestinal complaints, headaches, insomnia, premenstrual syndrome, respiratory problems and stress (Ernst & Soo, 2010). However, substantial evidences from clinical trials also should be undertaken to generalize the therapeutic efficacy of yoga.

3. Yogic prescription for CW and CE

Yogic prescription (YP) is a sort of yogic capsule that is comprised of yogic practices from all major yogic streams (*Jnana, Bhakti, Karma and Raj*) and designed as per workplace problems met at individual and organizational level. YP presumes nine hurdles (physical or mental illness, dullness, doubt, procastination, laziness, over indulgence, delusion, inability and instability) behind inidvidual and corporate failure and basically targets their dissolution (Pandya, 2006, p. 118) via its prolonged practice. The components of YP may vary as per nature of participants and workplace. Nonetheless, YP considers four possbile types of

human personality (rational, emotive, dyanmic, and volitional) and incorporates yogic practices from aforesaid four yogic streams accordingly. Dissolution of these hurdles via sustained YP practice leads to complete harmony (homogenity among feeling, thinking and action), harmony leads to talent, talent results in creativity and innovations, creativity results in perfection that further results in excellence as depicted in Figure 1.

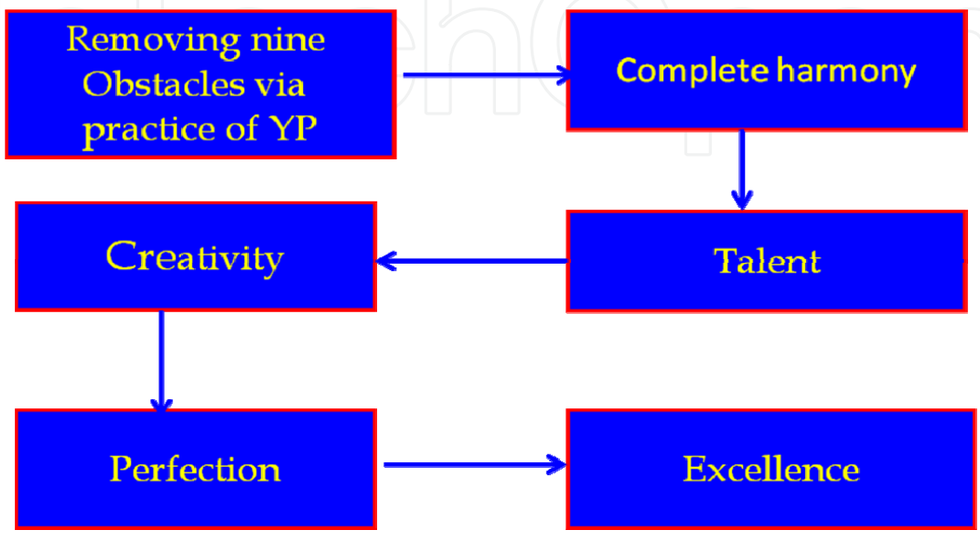

Fig. 1. Tentative model showing emergence of excellence via YP practice.

YPs have been found effective for health promotion and diseases management. Mind-body interventions derived from yoga (including breathing, meditation, postures, concentration and visualization) ameliorate stress-related mental and physical disorders—asthma, high blood pressure, cardiac illness, elevated cholesterol, IBS, cancer, insomnia, multiple sclerosis, and fibromyalgia (Becker 2000; Jacobs 2001). Curative effect of yoga has been seen in psychiatric problems, cardiovascular problems (CAD, hypertension), respiratory disorders (Bronchial asthma, OPD, pneumonia etc.), diabetes, neurological problems, musculoskeletal disorders, and others (Khalsa 2004). Ornish (2009) asserted that lifestyle changes (yogic way of living) could be considered not only as preventing chronic diseases but also reversing their progression—as an intensive non-surgical, non-pharmacological intervention. Moreover, the coronary heart disease, prostate and breast cancer, diabetes, and obesity account for 75% of health-care costs, yet the progression of these diseases can be stopped or even reversed with intensive lifestyle changes. Falus et al. (2010) highlighted the considerable connection between the length of telomeres and intensive changes in lifestyle and nutrition as well as behavioral and psychological factors. Epel et al. (2009) concluded that some forms of meditation might have salutary effects on telomere length by reducing cognitive stress and stress arousal and increasing positive states of mind and hormonal factors that might promote telomere maintenance. Between times one (before the Life Force Yoga program) and two (two weeks after learning it), participants reported 64% decrease in total mood disturbance, 53% decrease in average depression scores and overall mood disturbance continued to drop after two months (Bennett, Weintraub & Khalsa 2008).

Besides, the enhancement of SI, EI, CI and RI and their harmonious interplay by yogic practices is also substantiated by various scientific researches which are deemed essential for love and happiness at workplace: visionary leadership, sound management practices, creativity and innovations, and optimal work performance. Interestingly, levels of SI and EI are more about love and happiness at workplace. Moreover, happiness assists organization's members to be more productive, creative, fulfilled and with high morale that lead to outstanding performance and therefore, have a direct impact on organization's financial success (Claude & Zamor, 2003).

But the level of these four intelligences varies from person to person as per their personality types (dynamic, emotive, rational and mystic). Therefore, that holistic YP designed to promote CW and CE needs to include selected practices from *Ganan, Bhakti, Karma and Raj yoga.* Moreover, YP must include yogic practices of gross body, subtle body and causal body. As per author's self experience, pervious research findings and needs assessed in corporate companies, different tentative YPs can be designed that need to be tested to assess their effectiveness for promotion of four human intelligences and holistic health.

3.1 Yoga for CW

Yoga may be an integral part of worksite health promotion program (WHPP). "WHPP is an organized program in the worksite that is intended to assist employees and their family members (and/or retirees) in making voluntary behavior changes which reduce their health and injury risks, improve their health consumer skills and enhance their individual productivity and well-being whereas wellness is an intentional choice of a lifestyle characterized by personal responsibility, moderation, and maximum personal enhancement of physical, mental, emotional and spiritual health. Wellness programs typically begin by focusing on the reduction of health risks and then target issues that affect personal productivity, general well being, quality of work-life, personal growth, and other areas of interest" (Hunnicutt & Chapman, 2006, p. 4). On the other hand, CW is a good physical, mental, social and spiritual health of an individual and organizational workforce.

Royal path of yoga includes subsequent steps: *Yam*, *Niyam*, *Asana*, *Pranayama*, *Pratyahara*, *Dharana*, *Dhyan* and *Samadhi*. *Yama* (social codes) is the practice of improving social health and harmony that incorpates five vows: non-violence, truthfulness, non-stealing, non-possessiveness and celibacy. *Niyam* (moral codes) is the practice for creating homogeneity and harmony among feelings, thinking and action and comprised of five code of conducts-purity, contentment, austerity, self-study and complete surrender to God.

Asana (posture) is the practice for improving physical health, physical flexibility and fitness; overcoming conflicts, and maintaining steady posture for meditation. Yoga quietens the body and mind through vascular and muscular relaxation (Monro, 1995). Maintaining of posture was thought to lead strengthening and relaxation of voluntary muscles and eventually to control over the autonomic nervous system (ANS) (Vahia et al. 2004). In the same way, another study had reported that intensive practice of postural sequences as *Surya Namaskar* for longer than 10 minutes was associated with sufficiently elevated metabolic and heart response to improve cardio-respiratory fitness (Hagins et al., 2007). The continuous extension and flexion of muscles during yoga poses is associated with activation of

antagonistic neuromuscular system as well as tendon-organ feedback resulting in increased range of motion and relaxation (Riley, 2004).

Pranayama is the fourth step in the *Ashtanga* yoga system of Patanjali. The control of the breath leads to the control of the life force or *prana* and mind. The ancient yogis have propounded many breathing techniques to maximize the benefits of *prana* at somatic and psychic level. The word "*Pranayama*" is made up of two words, *Prana* and *Ayama*. *Prana* stands for the capacity to keep body alive by air, i.e breath and *Ayama* means expansion, stretching or extension and control of breath. Thus, Pranayama means the art of controlling breath. *Pranayama* is basically undertaken for somatic and psychic purification, regulation of *prana* to each body organ and to optimize the cardio-pulmonary and autonomic functions. The ancient yogis of yore searched the intimate connection between breath and mind. Breath control has indirect influence over the mind thereby showing mind-body interplay. Breathing is an automatic process controlled by the autonomic nervous system. The science of bio-energy including the breathing movements is the practical yoga par excellence. One of the main texts of *Hatha Yoga*, *Hatha Yoga Pradeepika*(HP) advocates that unsteady flow of *prana* in body leads to unsteady mind and vice-versa (HP, 2:2). The ancient yoga texts state that *Pranayam* practiced properly can cure all diseases, but if practiced wrongly can onset diseases. Therefore, *Pranayama* needs to be learned under the supervision of an experienced teacher by taking needful precautions.

Breathing is the most important bodily function. Learning of breath control helps control body metabolism. There are generally 10 types of *Pranayama* (techniques of breath control) but five (*Bhastrika, Kapalbhati, Anulom-Vilom, Bharamari* and *Udgeeth Pranayama*) of them are found more in practice due to their prominent benefits. *Pranayam* (breathing mechanics for control and expansion of *prana*) is the practice for attaining a sound mental health by channeling *pranic* flow in subtle energy channels, expanding and controlling *pranic* energy. Its regular practice regulates secretions of endocrine hormones and neuro-hormones. The voluntary control of breath can modulate autonomic nervous system functions including cardiac vagal tone as measured by heart rate variability (Lehrer 1999; Sovik 2000), vigilance and attention (Fokkema 1999), chemoreceptor and baroreflex sensitivity (Bernardi 2001; Spicuzza 2000), as well as the level of central nervous excitation (Brown & Gerbarg 2005). *Pranayam* like *Ujjayi* breathing increases vagal tone, heart rate variability (HRV) (Telles and Desiraju 1992) and respiratory sinus arrhythmia (RSA) (Carney et al. 1995) by inducing parasympathetic activity through numerous mechanisms, including slow breath rate, contraction of the laryngeal musculature, inspiration against airway resistance and breath holds (Cappo & Holmes 1984). Furthermore, they emphasized that slow breathing with prolonged expiration was shown to reduce psychological and physiological arousal, anxiety, panic disorder, depression, IBS, early Alzheimer's disease and obesity (Friedman & Thayer 1998; Haug et al. 1994). Thus, *Pranayam* is the best practice of boosting morale, will power, self-confidence and mind-body health.

Deep yoga breathing exercises like *Bhastrika* reduce the work load on the heart in two ways. Firstly, deep breathing leads to more efficient lungs, which means more oxygen is brought into contact with blood sent to the lungs by the heart. So, the heart doesn't have to work hard to deliver oxygen to the tissues. Secondly, deep breathing leads to a greater pressure

differential in the lungs, which leads to an increase in the circulation, thus resting the heart a little. Deep breathing improves the quality of the blood by promoting increased oxygenation in the lungs and thereby aiding the elimination of toxins and morbid matters; increases the digestion and assimilation of food by promoting enriched oxygen supply to stomach; and improves the health of the nervous system, including the brain, spinal cord, nerve centers and nerves by promoting supply of oxygenated blood accompanied by nutrients. This improves the health of the whole body, since the nervous system communicates to all parts of the body. Moreover, it rejuvenates glands, especially the pituitary and pineal glands. The brain has a special affinity for oxygen, requiring three times more oxygen than the rest of the body. This has far-reaching effects on well being. The movements of the diaphragm during the deep breathing exercise massage the abdominal organs - the stomach, small intestine, liver and pancreas. The upper movement of the diaphragm also massages the heart. This stimulates the blood circulation in these organs. The lungs become healthy and powerful, a good insurance against respiratory problems. Deep and slow yoga breathing reduces the work load for the heart. The result is more efficient and stronger heart that operates better and lasts longer. It also means controlled blood pressure and less chances of heart disease. Deep, slow breathing assists in weight control. If we are overweight, the extra oxygen burns up the excess fat more efficiently. If we are underweight, the extra oxygen feeds the starving tissues and glands. Slow, deep and rhythmic breathing causes a reflex stimulation of the parasympathetic nervous system which results in a reduction in the heart rate and relaxation of the muscles. These two factors cause a reflex relaxation of the mind, since the mind and body are very interdependent. In addition, oxygenation of the brain tends to normalize brain function and reduce excessive anxiety levels. The breathing exercises cause subsequent contractions of lung tissues thereby increasing elasticity of the lungs and rib cage. This creates an increased breathing capacity all day, not just during the actual exercise period.

Alternate Nostril Breathing (ANB) produces optimum functions to both sides of the brain-optimum creativity and optimum logical verbal activity. Regulated and harmonious rhythms of left and right nostrils calm the mind and the nervous system. Substantial studies have proven that the nasal cycle is associated with brain function. The electrical activity of the brain was found to be greater on the opposite side of decongested nostril. The right side of the brain controls creative activity while the left side controls logical verbal activity. The researches have shown that predominance of left nostril activates the right side of the brain thereby bettering creative performance. Similarly, the predominance of the right nostril activates the left side of the brain and betters verbal skills.

The concept of yoga therapy seems more advance and ancient compared to modern medical science. Yoga therapy advocates that manifestation of every disease accompanies with unrhythmic breathing and disturbed nasal cycles. Moreover, the onset of each disease can be perceived just by checking nasal cycle. Alternate nostril breathing technique is met efficacious to regulate alternate predominant flow of left and right nostril and hence activation of just two opposite sides of the brain. This clears blockage of the nasal passage and reestablishes the natural nasal cycle. For example, the yogis have known for a long time that prolonged breathing through the left nostril only (over a period of years) causes asthma. They also knew that this so-called incurable disease can be easily cured by teaching the patient to breathe through the right nostril and then to prevent its recurrence by practicing the alternate nostril

breathing technique. The yogis also believed that diabetes is caused to a large extent by breathing mainly through the right nostril.

Pratyhara (senses withdrawal) is the practice of conserving energy or *prana* by diverting senses inward from their external objects to seal outward *pranic* flow. It is an introspective practice of increasing bio-immunity, psycho-immunity and spiritual immunity at large. The prevalent practice like *Yoga Nidra* comes under *Pratyahara* in which practitioner goes in relaxed meditative state and gets dissociated from wish to act. Kjaer et al. (2002) made a study to investigate whether endogenous dopamine release increased during loss of executive control in meditation (*Yoga Nidra*) and found a 65% increase in endogenous dopamine release, concomitant increase in theta activity, decreased desire for action and heightened sensory imagery.

Dharana (concentration) is the practice of hitting target by being pin pointed. i.e., hundred percent focused mental flow at a particular target. The practice like mindful awareness, mindful based stress reduction technique, guided imagery and advance stage of *Yoga Nidra* come under this. Siegel (2009) hypothesized that mindful awareness induced internal attunement thereby catalyzing the fundamental process of integration. Moreover, he asserted that integration—the linkage of differentiated elements of a system led to the flexible, adaptive, and coherent flow of energy and information in the brain, the mind and relationships. *Dharana* has shown remarkable effect on brain activity. The brain is an electrochemical organ that uses electromagnetic energy to function. Electrical activity emanating from the brain is displayed in the form of brainwaves. There are four categories of these brainwaves. They range from delta with high amplitude and low frequency to beta with the low amplitude and high frequency. Men, women and children of all ages experience the same characteristic brainwaves. They are consistent across cultures and country boundaries. During meditation brain waves alter. Emission of Beta waves (13-30 cycles per second) is an indication of awaking awareness, extroversion, concentration, logical thinking and active conversation. A debater would be in high beta. A person making a speech, or a teacher, or a talk show host would all be in beta when they are engaged in their work. Emission of Alpha (7-13 cycles per second) is associated with relaxation, non-arousal, meditation and hypnosis. Emission of Theta (4-7 cycles per second) is associated with the activities like dreaming, day-dreaming, creativity, meditation, paranormal phenomena, Extra Sensory Perception (ESP) and shamanic journeys. Emission of Delta (1.5-4 or less cycles per second) is an indicator of deep and dreamless sleep. Mindfulness meditation and related techniques are intended to train attention for the sake of provoking insight. It can be thought as the opposite of attention deficit disorder. A wider, more flexible attention span makes it easier to be aware of a situation, easier to be objective in emotionally or morally difficult situations and easier to achieve a state of responsive, creative awareness or 'flow'.

Dhyan (meditation) is the prolonged concentration on a particular target that culminates in self-realization and paranormal accomplishments. The subsequent practice of meditation is supportive for awakening ESP and reaching self-realization. Neuroimaging studies had shown that meditation resulted in activation of the prefrontal cortex, the thalamus and inhibitory thalamic reticular nucleus and a resultant functional deafferentation of the parietal lobe (Mohandas, 2008). He further asserted that

neurochemicals' (GABA, endogenous dopamine, epinephrine, nor-epinephrine, encephalin, acetylcholine etc.) changes as a result of meditative practice involved all the major neurotransmitter systems that contributed to ameliorate anxiety, depressive symptomatology and psycotogenic property. Meditation works because of the relationship between the amygdala and the prefrontal cortex. Simply, the amygdala is the part of the brain that decides when to get angry or anxious (among other things) and the pre-frontal cortex is the part that makes us stop and think about things (it is also known as the inhibitory centre). Moreover, intuitive flashes and ESPs are very common when mind gets tranquilized and calm in deep meditative stage. In such condition there happens harmonious interplay among conscious, subconscious and unconscious minds thereby causing intuition and ESPs.

Samadhi (trance or super-consciousness) is fusion of embodied consciousness with cosmic consciousness; a steady feeling of holism and interconnectedness. As per yoga, *Samadhi* is supposed as the stage of total health where an aspirant gets freed from the effects of three strands—*Sat, Raj and Tam* and realizes one's real self. On other word, it is *Nirudha* stage of psyche that represents the total health.

3.2 Yoga for CE

Leadership is one of the most important components of CE and is more about putting first things first to translate vision into action. Prolonged yoga practice is deemed responsive to develop spiritual traits- self awareness, field independence, humility, tendency to ask fundamentals- why; ability to reframe, positive use of adversity and sense of vocation (Zohar, 2005) that are essential for effective leadership and translating holy organizational vision into action. Correspondingly, this sub head will advocate yogic efficacy for promoting organizational excellence thereby excelling leadership and four human intelligences (SI, EI, CI and RI).

CE is the function of four intelligences—SI (farsightedness, serenity, discriminative wisdom, personal meaning production, critical existential thinking, transcedental awareness and concious state expension), EI (affectionate and loving relationship with family and society; memorizing God's compassion is unbounded, transfer of privilege, career development, team building, empathy, sound leadership and civility), CI (creativity and innovations) and RI (good managerial capabilities, job placements and technical performances) born by an organization family. The optimal level of these intelligences among organization family members can be induced by inculcating yogic culture among them. On the basis of the ladder proposed by *Raj yoga,* an interesting model for achieving CE can be set to overcome the nine hurdles. Removing aforesaid hurdles by appropriate yogic practices induces inner harmony; inner harmony induces talent, talent leads to creativity and innovations; creativity and innovation lead to perfection; and perfection culminates in excellence. On the other hand, employee health and performance are closely linked to each other. Good workers' health leads to productivity at the work; productivity at the work leads to business competitiveness; business competitiveness leads to economic development and prosperity; economic prosperity leads to social well being and wealth; social well being and wealth again help maintain good employee health (Burton, 2010) as depicted in Figure 2.

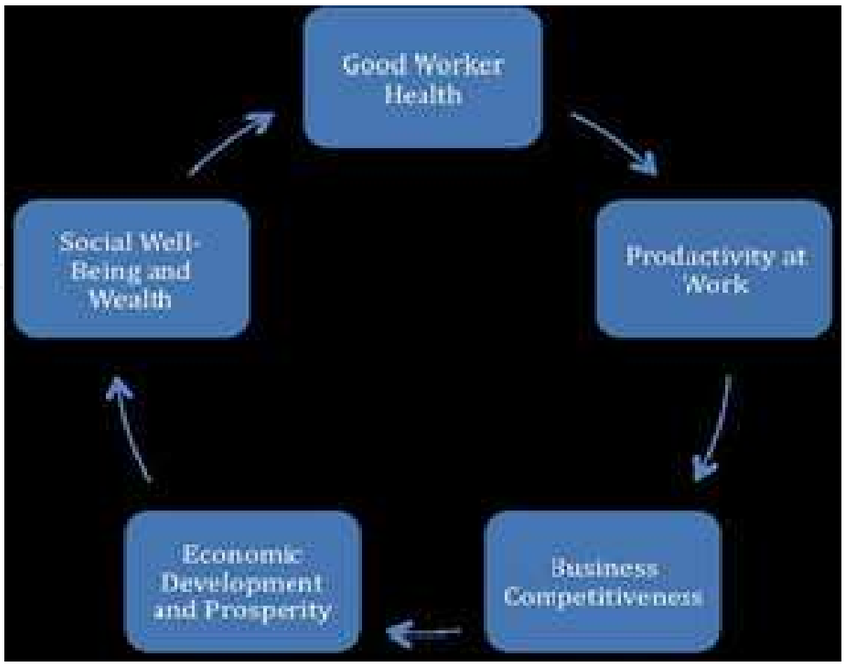

Fig. 2. Relationship between Health and Wealth.

This hierarchical relationship between health and wealth also displays the high possibility of achieving CW and CE via yoga practices. Therefore, total health and perfection need to be developed first at individual level for CW and CE by adopting persistent yoga practices. This may be plausiable by developing corporate yoga culture to provide equal chance of practicing yoga for each and every organizational family member.

4. Preventive and therapeutic value of Yoga

Preventive and therapeutic value of yoga has been argued as a side benefit of yogic practices especially associated with gross and subtle body and most of the yoga practitioners have been found to have the same concern. Substantial scientific studies undertaken have also attempted to substantiate the preventive and curative value of yoga practices like cleansing techniques (*Shatkriyas*), postures (*Asanas*), breathing techniques (*Pranayamas*), gestures (*Mudras*), psychic locks (*Bandhas*), concentration (*Dharana*) and meditation (*Dhyan*). As far as preventive and curative value of CY for CW is concerned, it is deemed contextual to discuss efficacy of CY in the connection of the most prevalent corporate health problems such as work related stress, respiratory problems, cardiovascular problems, digestive problems and genitourinary problems.

4.1 Yoga versus stress

Globalization, technological advancements, intermixing of work cultures, recessions and subsequent changes in the nature of work are in fast pace. Consequently, stress is found with everyone at workplace whether rich or poor, young or old, male or female; no one is immune from it. Stress may be the biggest single cause for illness or premature death. WHO has declared stress as worldwide epidemic and reported job stress as "the twentieth-century

disease". The American Institute of Stress (AIS) states that stress related illness costs economy more than $ 100 billion per year. Additionally, AIS estimated in 2001 that stress costs organizations $ 300 billion in healthcare, workers compensation, absenteeism, and turnover. The productivity losses hover around $17 billion annually. Every health problem from simple headache to heart attack, from psychosomatic disorders to stroke can be linked to stress that is called the plague of the 21st century. Stress-related illness and injuries account for almost three-fourths of employee absenteeism.

A growing body of research evidence supports the belief that certain yoga techniques may improve physical and mental health through down-regulation of the hypothalamic–pituitary–adrenal (HPA) axis and the sympathetic nervous system (SNS) (Ross & Thomas, 2010). The HPA axis and SNS are triggered as a response to a physical or psychologic demand (stressor), leading to a cascade of physiologic, behavioral, and psychologic effects, primarily as a result of the release of cortisol and catecholamines (epinephrine and norepinephrine). This response leads to the mobilization of energy needed to combat the stressor through the classic ''fight or flight''syndrome. Over time, the constant state of hypervigilence resulting from repeated firing of the HPA axis and SNS can lead to dysregulation of the system and ultimately diseases such as obesity, diabetes, autoimmune disorders, depression, substance abuse, and cardiovascular disease (Sterling, 2004; McEwen, 2000, as cited in Ross & Thomas, 2010). Conversely, substantial studies have shown yoga to have an immediate downregulating effect on both the SNS/HPA axis response to stress. Studies show that yoga decreases levels of salivary cortisol (Michalsen, 2005; West, 2004), blood glucose (Gokal & Shillito, 2007; Khatri et al. 2007) as well as plasma rennin levels, and 24-hour urine norepinephrine and epinephrine levels (Selvamurthy et al., 1998). Yoga significantly decreases heart rate and systolic and diastolic blood pressure (Damodaran et al., 2002; McCaffrey, Ruknui, Hatthakit & Kasetsomboon, 2005; Selvamurthy et al., 1998) (as cited in Ross & Thomas, 2010) . Studies suggest that yoga reverses the negative impact of stress on the immune system by increasing levels of immunoglobulin A (Stuck et al., 2003) as well as natural killer cells (Rao et al., 2008) (as cited in Ross & Thomas, 2010). Yoga has been found to decrease markers of inflammation such as high sensitivity C-reactive protein as well as inflammatory cytokines such as interleukin-6 (Pullen et al., 2008) and lymphocyte-1B (Schultz et al., 2007) (as cited in Ross & Thomas, 2010).

Aforementioned studies show that yoga has an immediate quieting effect on the SNS or HPA axis response to stress unless the precise mechanism of action has not been determined. The proposed hypotheses substantiate that yoga exercises cause a shift toward parasympathetic nervous system dominance, possibly via direct vagal stimulation (Innes, Bourguignon and Taylor, 2005); significant reductions in low-frequency heart rate variability (HRV)—a sign of sympathetic nervous system activation—in depressed patients following an 8-week yoga intervention (Shapiro et al., 2007); decrease in anxiety (Gupta et al., 2006; Michalsen, 2005; Telles et al., 2006; West, 2004) and increase in emotional, social, and spiritual well-being(Moadel et al., 2007) (as cited in Ross &Thomas, 2010).

4.2 Yoga versus respiratory problems

Yogic practices are always undertaken with synchronization of action, mental awareness and breathing pattern. Particularly, *Pranayam*, *Bandha, Mudra and Asana* incorporate systemic and subsequent inhalation, exhalation, inner breath retention and outer breath

retentions; contraction and relaxation of lung tissues and chest wall thereby affecting the cardiopulmonary function (lung function, heart rate, breath rate, heart rate variability, oxygen consumption, and CO_2 expulsion), endocrine secretions and neural secretions and function of associated visceral organs. *Asanas* (postures) are basically somatic techniques for physical conditioning; *Pranayam* is a technique for breath control (inhalation, exhalation and retention) and expansion of *prana* (life energy) that strengthens respiratory muscles and better ventilation; a *Mudra* (gesture) is a sort of seal- a body movement to hold energy, or concentrate awareness; and a *Bandha* is an energy lock, using muscular constriction to focus awareness (Raub, 2002). Early studies (Joshi et al., 1992; Makwana et al., 1988) reported improvement in some, but not all, measures of ventilation after breath control exercises alone. For example, Joshi et al. (1992) followed lung function in 75 males and females with an average age of 18.5 years during yoga breath-control exercises. After 6 weeks of practice, they reported significant increases in forced vital capacity (FVC), forced expiratory volume in 1 second (FEV1), peak expiratory flow rate (PEFR), maximum voluntary ventilation (MVV), as well as a significant decrease in breathing frequency (fB), and prolongation of breath-holding time. Other studies reported similar improvement in lung function after practicing yoga postures alone or combined with other yoga techniques. Konar et al. (2000) reported that the practice of *Sarvangasana* (shoulder stand) twice daily for 2 weeks significantly reduced resting HR and left ventricular end-diastolic volume in 8 healthy male subjects. Birkel and Edgren (2000) reported that yoga postures, breath control, and relaxation techniques taught to 287 college students (89 men and 198 women) in two 50-minute class meetings for 15 weeks significantly improved FVC of the lungs measured by spirometry. In a similar study, 1 hour of yoga practice each day for 12 weeks significantly improved FVC, FEV1, and PEFR in 60 healthy young women having 17 to 28 years of age(Yadav & Das, 2001).

Moreover, yogic interventions are also found beneficial for improving ailments like asthma (Bhagwat, Soman, & Bhole, 1981; Bhole, 1967; Nagendra & Nagarathna, 1986; Nagendra & Nagarathna, 1985; Jain & Talukdar, 1993; Sabina et al., 2005; Singh, Wisniewski, Britton, & Tattersfield, 1990; Vedanthan et al., 1998), pulmonary tuberculosis (Milani, Valli & Bhole, 1992; Prakasamma & Bhaduri, 2004; Visweswaraiah & Telles, 2004), pleural effusion (Prakasamma & Bhaduri, 1984), rhinitis (Sim, 1981), sinusitis(Rabago et al., 2002), chronic obstructive pulmonary diseases (Behera, 1998; Donesky-Cuenco, Nguyen, Paul & Carrieri-Kohlman, 2009; Kamath & Chauhan, 1982; Pomidori, Camigotto, Amatya, Bernardi & Cogo, 2009; Tandon, 1978), chronic bronchitis (Behera, 1998) (as cited in McCall, 2009).

Controlled clinical studies have shown that an integrated approach of yoga therapy (consisted of yoga exercises and postures for 25 minutes; slow, deep breathing for 10 minutes; slow mental chanting for 15 minutes; and a devotional session as a daily practice) to be beneficial in the clinical management of asthma. A 65-minute daily practice of yoga for 2 weeks improved PEFR, medication use, and asthma attack frequency in 53 patients when compared to an age-, gender-, and clinically matched control group (Nagarathna & Nagendra, 1985). In a long-term, follow-up (3 to 54 months) prospective study (Nagendra & Nagarathna, 1986) made among 570 asthmatics showed overall significant improvement in PEFR after a similar yoga training program. The greatest improvement was found in patients who had practiced yoga most frequently and intensively thereby showing asthma medication reduction among approximately 70% of the practitioners. The effects of two

Pranayamas on lung function, airway reactivity, respiratory symptoms, and medication use were assessed in 18 patients with mild asthma in a randomized, double-blind, placebo-controlled, crossover trial (Singh et al., 1990). The subjects were taught *Pranayamas* by using a breathing device called the Pink City lung (PCL; Pulmotech, Jaipur, India) exerciser that could be used with a matched placebo breathing device.

After a baseline measurement, the subjects were undergone through the practice of slow deep breathing for 15 minutes, two times a day for consecutive 2-week periods, randomly alternating the breathing devices for each practice period. Measured lung function variables (FEV1, FVC, PEFR), symptom scores, and medication use improved with the PCL device with small and statistically insignificant changes. However, there was a statistically significant increase in the dose of histamine required to produce a 20% decrease in FEV1, a provocative airway test commonly used to assess lung responsiveness to nonspecific bronchoconstrictors. The findings indicate that *Pranyama* may lead to an overall clinical improvement in mild asthma. In a subsequent letter to the editor, Stanescu (1990) commented on possible autonomic mechanisms suggested by Singh et al. (1990) that might lead to reduced airway responsiveness. Studies previously conducted by Stanescu et al. (1981) on healthy subjects showed the efficacy of controlled yoga breathing techniques (i.e., slow, near VC maneuvers accompanied by apnea at end inspiration and end expiration) for significant lowering of ventilatory responsiveness to increased carbon dioxide. Two early studies (Behera & Jindal, 1990; Jain & Talukdar, 1993) reported on quality of life benefits provided by the effects of various yoga exercises among asthmatics. Behera & Jindal (1990) assessed the benefits of daily yoga exercises contained with breath control and postures, over a 6- to 8-week period in 41 asthmatics. Although the authors reported an overall subjective improvement in asthma symptoms, objective lung function measurements showed improvement in some, no change and reduced in some. Jain and Talukdar (1993) reported a similar overall effect of yoga therapy on exercise capacity in 46 asthmatics and reported improvement in a 12-minute walking test, a modified Harvard step test, and a more subjective index of exercise tolerance. However, it was unclear if the improvements were due, in part, to a placebo response. In the more recent literature (after 1995), breath-control and relaxation techniques in both children and adults with asthma have been reported to improve some, but not all, measures of lung function (e.g., PEFR, MVV, FEV1, and FVC), decrease usage of medication, and increase exercise tolerance (Blanc-Gras et al., 1996; Khanam et al., 1996; Manocha et al., 2002; Sathyaprabha et al., 2001; Vedanthan et al., 1998). Large variability in the subject population, questionable compliance in the yoga treatment groups, and potentially adverse outcomes in some subjects further complicates interpretation of the effects specific to a particular relaxation technique (Ritz, 2001). Further studies are warranted, therefore, to better understand the mechanisms of response to yogic intervention and to determine its clinical value for asthmatics.

Behera (1998) reported improvement in shortness of breath and some lung function parameters in patients (n= 15) with the history of chronic bronchitis and age range 48 to 75 years (58.9 6±11.1 years) who received yoga therapy that consisted of breath control and 8 types of *asanas* for a period of 4 weeks. The patients had baseline assessment of their history of chronic bronchitis, including spirometry, medication strategy, and exercise tolerance. They were instructed yogic postures (e.g., *Vajrasana, Simhasana, Sarvangasana, Chakrasana & Matsyasana*) and breathing techniques for 1 week and were encouraged to practice daily with follow-up yoga sessions each subsequent week along with medication. Reevaluated

clinical status and pulmonary function revealed a significant improvement in FEV1 and PEFR after second week and significant improvements in VC and PEFR after fourth week excluding a patient's reporting of perceptual decrease in shortness of breath. No changes were noted in the amount of medication taken. This preliminary study (with poor research design) was made among few patients for short duration. Unfortunately, no other studies examining the possible benefits of yoga on chronic obstructive lung disease have been published yet and hence generalization of the outcomes needs further studies to eliminate its limitations.

4.3 Yoga versus cardiovascular problems

Cardiovascular disease continues to be a significant health issue, contributing to more deaths than any other disease in developed countries while becoming the leading cause of death in developing countries worldwide (Yach, Leeder, Bell, & Kistnasamy, 2005, as cited in deJong, 2009). Although the risk factors for cardiovascular disease are well known, they remain poorly controlled in the United States (Glover, Grerenlund, Ayala, & Croft, 2005) leading to increased costs for treatment (American Heart Association, 2005, as cited in deJong, 2009). Smoking, hypertension, diabetes mellitus, obesity, poor dietary patterns, physical inactivity, alcohol consumption, elevated blood apolipoprotein levels, and psychosocial factors are estimated nine risk factors that account for approximately 90% of population-attributed risk for cardiovascular disease (Yusuf et al., 2004, as cited in deJong, 2009). Besides, emotional stress is one more major cause in the pathogenesis of cardiac diseases like ischemic heart disease (IHD) (Eastwood &Trevelyan, 1971, as cited in Ornish et al., 1983). Some emotions and behaviors are associated with IHD include intense anxiety, depression, feelings of helplessness, and "type A behavior," characterized by ambitiousness, competitiveness, impatience, and a sense of time urgency (Hackett & Rosenbaum , 1980, as cited in Ornish et al, 1983). Significant lipid risk factors for CVD are increased levels of serum cholesterol and triglycerides, increased low-density lipoprotein (LDL) cholesterol, decreased high-density lipoprotein (HDL) cholesterol, and increased concentration of apoB-carrying lipoproteins (Raub, 2002). In fact, Chiuve, McCullough, Sacks and Rimm (2006) estimated that 62% of all coronary events could be avoided if all men adhered to a low-risk lifestyle that included smoking abstinence, regular exercise, healthy diet, moderate alcohol intake, and the maintenance of a healthy weight (as cited in deJong, 2009). Consistent citation was also made by Ornish et al. (1983) that concluded that bio-behavioral techniques such as yoga (meditation, pranayama, and progressive relaxation) may reduce some of the cardiovascular risk factors- BP (Bensen, 1977) and plasma cholesterol levels (Patel, 1976; Cooper & Aygen, 1979). Yoga's potential benefit to patients with CVD has been reported by limited literature (Raub, 2002). Adoption of a yoga lifestyle can significantly reduce many of the risk factors for CVD, including increased body weight, altered blood lipid profile, and elevated blood pressure (BP) (Mahajan et al., 1999; Manchanda et al., 2000; Schmidt et al., 1997, as cited in Raub, 2002). As cited in Field (2010), Yogendra et al. (2004) reported benefits of one year long yoga life style among the patients of advanced coronary artery disease. They found 23% reduction in cholesterol in the yoga group as compared to 4% in the standard treatment control group. Besides, serum low density lipids also seen reduced more in the yoga group (26% versus 3% in the control group). In a similar study on coronary artery disease, a dietary change plus yoga group was compared to a group who only made dietary changes (Manchanda et al., 2000, as cited in Field, 2010). After one year of weekly

sessions, the yoga group had fewer anginal episodes per week, improved exercise capacity, decreased body weight and lower serum total cholesterol levels. Low-density lipoprotein, cholesterol and triglyceride levels also decreased in the yoga group. Revascularization procedures (coronary angioplasty or bypass surgery) were less frequently required in the yoga group, and coronary angiography showed that more lesions regressed (20% versus 2%) and fewer lesions progressed (5% versus 37%) in the dietary change plus yoga group. Pullen et al. (2009) also reported improved cardiovascular endurance and decreased inflammatory markers (Interleukin-6 and C- reactive protein) in heart failure patients thereby showing similar effects of yoga as massage therapy. Schmidt et al. (1997) reported that a 3-month residential training program of yoga, meditation, and vegetarian nutrition decreased body mass, total serum and LDL cholesterol, fibrinogen, and BP (as cited in Raub, 2002). Mahajan et al. (1999) reported a similar reduction in risk factors for patients with coronary artery disease (CAD) and documented angina (chest pain) where subjects with risk factors for CAD were randomly assigned to a yoga intervention group (*n*=5 52) or a control group (*n* =5 41) (as cited in Raub, 2002). Both groups received lifestyle advice and the intervention group received additional yoga training. Serial evaluations at 4, 10, and 14 weeks showed a regular decrease in all lipid parameters, except for HDL, only in the patients with angina receiving yoga intervention. The most impressive of these studies was a 1-year prospective, randomized controlled trial of 42 men with angiographically documented CAD (Manchanda et al., 2000, as cited in Raub, 2002). A subgroup (*n* =5 21) treated with an active program of risk factor and diet control along with yoga and moderate aerobic exercise showed significant reduction in angina, improved exercise capacity, and greater reductions in body weight, total cholesterol, LDL cholesterol, and triglyceride than the control group (*n* = 5 21) treated conventionally with risk factor control and the American Heart Association (AHA) Step I diet.

Revascularization procedures also were less frequent in the yoga group and coronary angiography repeated at 1 year showed a significant regression of atherosclerotic lesions. The Lifestyle Heart Trial (Ornish et al., 1998) demonstrated that intensive lifestyle changes could lead to regression of CAD after only 1 year of a 5-year program. Forty-eight (48) patients with moderate-to-severe CAD were randomized to an intensive lifestyle change group or to a usual-care group. The lifestyle changes consisted of a 10% fat whole–food vegetarian diet, aerobic exercise, stress management training (yoga and meditation), smoking cessation, and group psychologic support. Clinical status was followed by quantitative coronary angiography and frequency of cardiac events. Of the 35 patients completing the 5-year follow-up, 20 in the experimental group showed a 4.5% relative improvement in cardiovascular status after 1 year and a 7.9% relative improvement after 5 years. The control group had a relative worsening of cardiovascular status after 1 and 5 years (5.4% and 27.7%, respectively), and more than twice as many cardiac events. Intensive lifestyle changes/yogic life style, therefore, can cause a regression of CAD. Nonetheless, the sparse of randomized controlled studies for assessing the efficacy of yogic intervention on CVD, especially in comparison to the conventional practice of Western medicine, has made it difficult to assess the direct benefits of an integrated yoga practice on patients with CAD.

Another most prevalent risk factor for cardiac problems is hypertension. Early studies on yoga intervention for hypertension investigated the value of total body relaxation postures, primarily *Savasana* (Chaudhary et al., 1988; Mogra and Singh, 1986, as cited in Raub, 2002). The authors reported reductions in BP that were similar to control by drug therapy or biofeedback;

however, small numbers of subjects were utilized in the studies and there were no controls. I hour daily yoga practice of three month decreased blood pressure, blood glucose, cholesterol and triglycerides and improved subjective well-being and quality of life among mild to moderate hypertensive participants (Damodaran et al., 2002, as cited in Field, 2010).

Yoga exercises twice a day for 11 weeks were found to be as effective as standard medical treatment in controlling measured variables of hypertension (Murugesan et al., 2000). In a randomized study, 33 hypertensive patients with 35 to 65 years of age, were assigned into three groups receiving yoga therapy, physician-provided medication, and no treatment (control group). Preanalysis/postanalysis regarding systolic and diastolic blood pressure, pulse rate, and body weight revealed that both the treatment groups (i.e., yoga and drug) were effective in controlling hypertension. Twenty male patients with essential hypertension (EH) were treated for 3 weeks with postural tilt stimulus (tilt table) or with postural yoga *asanas* to restore normal baroreflex sensitivity (Selvamurthy et al., 1998). Progressive autonomic changes were assessed by cardiovascular responses to head-up tilt and cold pressor stimulus, electroencephalographic indices, blood catecholamines, and plasma rennin activity. There was a significant reduction in blood pressure after 3 weeks in both treatment groups, indicating a gradual improvement in baroreflex sensitivity. A similar improvement in baroreflex sensitivity, and significant reductions in systolic and diastolic blood pressure, were seen in 81 patients (58-61 years of age) with stable chronic heart failure (CHF) who practiced slow and deep breathing (Bernardi et al., 2002). The same authors (Bernardi et al., 1998) previously reported that a slow rate of breathing in patients with CHF increases resting oxygen saturation, improves ventilation/perfusion mismatching, and improves exercise tolerance. These changes were obtained by simply modifying the breathing pattern, from a resting, spontaneous ventilation of approximately 15 breaths per minute to 6 breaths per minute, which seems to cause a relative increase in vagal activity and a decrease in sympathetic activity. The effects on baroreflex sensitivity were similar to those obtained with captopril treatment in patients with CHF (Osterziel et al., 1988). Captopril belongs to a group of drugs called angiotensin-converting enzyme (ACE) inhibitors that help to lower blood pressure and make the heart beat stronger. This medication is used to treat hypertension (high blood pressure) and heart failure.

4.4 Yoga versus digestive problems

Hectic and unnatural corporate life style (fast food, materialistic relationship, hectic schedule, distanced natural environment, odd duty hours, smoking, alcoholism, poor intake of mental and emotional diet etc.) has been a sufficient condition to trigger and progress digestive problems like hyper acidity, irritable bowel syndrome, gastritis, pancreatitis, flatulence, ulcerative colitis, diabetes, inflammatory bowel disease, constipation, indigestion, hiccups, gastroesophageal reflux disease (GERD), hepatitis, gall stones, celiac disease among corporate workforces. Additionally, because of being a major system of nutrients absorption and morbid matter elimination, disordered digestive system is sufficient to disturb homeostasis and to trigger varieties of somatic and psychological problems. Sages of yore have rightly spoken that good digestion is a key to radiant health and is the function of psychological well being. Yoga views the digestive system as a very sensitive mirror of the mind and encourages examining overall lifestyle choices, emotions and other mental components in the diagnosis and healing of the digestive problems (Butera, 2010, p. 14).

Within a few seconds of "flight or fight" response happened in the central nervous system due to distress, most of the blood in the body gets shunted out from the digestive system and into the major muscle groups. This negatively impacts on the contractions of the digestive muscles that help move food through the body as well as the fluids and secretions that are needed for healthy digestion. Consequently, persistent mental distress results in esophagus spasms, indigestion, nausea, diarrhea, constipation, stomach ulcers, celiacs disease, irritable bowel syndrome as well as other more severe digestive ailments.

Yogic life style (regular practice of a complete yogic approach including selected- cleansing techniques, postures, gestures, psychic locks, concentration, meditation, natural diet as per body constitution and season, exercising charter of righteousness, and observance of social and moral codes) is found beneficial for the proper digestion and elimination, and healing of various digestive disorders like hyper acidity, irritable bowel syndrome, gastritis, pancreatitis, flatulence, ulcerative colitis, diabetes, inflammatory bowel disease, constipation, indigestion, hiccups, Gastroesophageal reflux disease (GERD), Hepatitis, Gall stones, Celiac disease etc.

Practice of yogic postures causes sponge like squeezing in the soft tissues of the digestive organs, and encourages stale and waste-bearing fluids to be out of the tissues thereby facilitating the elimination of the morbid matters and subsequently supply of essential nutrients to these areas. Subsequent opening and stretching of digestive organs during the practice of yogic postures regulates the Peristalsis movement that is a key involuntary process for the proper digestion and elimination. Besides, yogic breathing exercises send oxygen deep into the cells of the body and help it to absorb nutrients and excrete morbid matters thoroughly. On the other hand, efficacy of Yoga for stress management, rebalance of the autonomic nervous system to create deep relaxation and dominate parasympathetic system is well documented.

Langhorst et al. (2007) analyzed the effects of a comprehensive lifestyle modification program (a structured 60-hour training program over a period of 10 weeks which included stress management training, psycho-educational elements, and self-care strategies) on health-related quality-of-life, psychological distress, and clinical parameters in 60 patients with ulcerative colitis (UC). The 60 patients were randomly assigned to an intervention group or a usual-care control group. Comparison of the measurements taken at baseline, after 3 and 12 months showed significant improvement in the quality of life and emotional well-being of the participants as compared to controls.

4.5 Yoga versus genitourinary disorders

Most of the corporate workforces have been competing for material prosperity and focused on sensual indulgences. The most fashionable one is over and multi-partner romantic relationship. Prevalent dress codes, especially girls', unnatural food at cafeteria, pornographic literatures and audio-visual aids and western corporate culture are serving as the best catalysts to provoke more lust and engage in frequent sexual activities. The incestuous workplaces are in ascending order. Consequently, corporate workforces are extremely prone to the genitourinary problems and seriously loosing their health and wealth. Hence, it seems quite contextual to address significance of CY for managing the genitourinary problems. As yoga argued, over sexual activities result in suppressed

immunity, low self-esteem, low morale and different health problems, especially genitourinary problems such as urinary stress incontinence, poor sexual orgasm, HIV AIDS, syphilis, infertility, miscarriage, premature ejaculation (PE), climacteric syndrome and pregnancy problems.

The efficacy of mind-body intervention like yoga was supposed effective means for bettering genitourinary health for long. Yoga has been found effective to promote genitourinary health and heal the concerned problems like urinary stress incontinence (Milani, Valli & Bhole, 1992), women sexuality (Brotto, Krychman & Jacobson, 2008; Dhikav et al., 2007), climacteric syndrome (Chattha et al., 2008), PE (Dhikav et al., 2007), pregnancy outcomes (birth weight, preterm labor, and IUGR either in isolation or associated with PIH) (Narendran et al., 2005), labor pain and duration (Chuntharapat, Petpichetchian & Hatthakit, 2008). Interestingly, Yoga appeared as a non-pharmacological measure for improving female sexual functions (Dhikav et al., 2007). Dhikav et al. (2010) also reported that after the completion of yoga sessions; the female sexual functions scores were significantly improved ($P< 0.0001$). The improvement occurred in all six domains of female sexual function index (FSFI) (i.e., desire, arousal, lubrication, orgasm, satisfaction, and pain) was more in older women (age > 45 years) compared with younger women (age < 45 years) thereby proving yoga as an effective method of improving all domains of sexual functions in women. Considering widespread acceptability of yoga, non-pharmacological nature, and apparent beneficial effects in the present study, this modality deserves further study. Chattha et al. (2008) studied the effect of 8 week-integrated yoga program consisted of breathing practices, sun salutation and cyclic meditation on cognitive functions in climacteric syndrome by sampling 120 premenopausal women between 40 and 55 years with follicle-stimulating hormone level equal to 15miu/ml. Sample was randomly assigned in two groups as participants and controls and participants were allowed to practice yoga module one hour per day, 5 day per week for 8 weeks. In yoga group they reported improvement on flushes and night sweats; and cognitive functions such as remote memory, mental balance, attention and concentration, delayed and immediate recall, verbal retention and recognition tests after 8 week. Dhikav et al. (2007) conducted another study to know if yoga could be tried as a treatment option in PE and to compare it with fluoxetine. For the same, they sampled 68 patients (38 yoga group; 30 fluoxetine group) attending the outpatient department of psychiatry of a tertiary care hospital and employed both subjective and objective assessment tools to evaluate the efficacy of the yoga and fluoxetine in PE and found that all 38 patients (25–65.7% = good, 13–34.2% = fair) belonging to yoga and 25 out of 30 of thefluoxetine group (82.3%) had statistically significant improvement in PE thereby showing yoga as a feasible, safe, effective and acceptable non-pharmacological option for PE. Nonetheless, more studies involving larger patients could be carried out to establish its utility in this condition. Vaze and Joshi (2010) also concluded that Yoga as a free-of-cost noninvasive method that is fairly effective and is strongly recommended to all women of menopausal age. Another study conducted by Brotto et al. (2008) reported that Eastern techniques like acupuncture, yoga, mindfulness and other forms of spiritual practice might offer a unique approach to enhance women's sexuality. However, it needs the development of sound theory and controlled studies; they might be the key for improving women's lack of sexual satisfaction. Narendran et al. (2005) conducted a study to assess the effect of yoga on pregnancy outcomes and recruited 335 women with 18-20 weeks of pregnancy. Yoga program including selected postures, breathing techniques and meditation was given to 169

women of yoga group one hour daily until delivery whereas 166 women of control group were suggested to go for 30 minutes walk twice a day during the study. Intervened integrated yoga approach during pregnancy was found safe thereby showing improvement in birth weight, preterm labor, and IUGR either in isolation or associated with PIH, with no increased complications in yoga group as compared to control group. Chuntharapat et al.'s (2008) findings suggested that 30 min of yoga practice at least three times per week for 10 weeks is an effective complementary means for facilitating maternal comfort, decreasing pain during labor and 2 hour post delivery, and shortening the length of labor that highlighted yoga as an alternative nursing intervention to improve the quality of maternal and child health care.

5. Summary

In 21st century the corporate world is associated with the most tension giving elements such as competition, deadlines, market conditions and above all the desire to reach high on the corporate ladder. These four elements are ultimately responsible to impair the harmonious interplay of body, mind and spirit thereby leading to various health problems among corporate workforces. On the other hand, yoga seems as an emerging avenue for the worldwide corporate health and wealth. The packaging of CY for corporate life style is the best preventive and therapeutic measure to optimize organizational health and culture as well. Persistent practice of CY by a corporate executive makes him/her healthy and wealthy. CY will prove to be an art and science of life for a corporate executive.

Yoga is an ultimate attempt for the fusion of embodied consciousness with supreme consciousness that subsequently proceeds from the practice of social adjustment (*Yam*), moral observance (*Niyam*), postures (*Asana*), breathing mechanics (*Pranayama*), senses withdrawal (*Prathyara*), concentration (*Dharana*), meditation (*Dhyan*) and super-consciousness (*Samadhi*). Regular practice of yoga is supposed to empower corporate health, happiness and harmony and hence wealth too.

The relevance and popularity of yoga is ascending in the entire West and Europe. Particularly, in UK and USA, yoga has become more popular where the women form 70-90% of the student population. Nonetheless, it is difficult to say in numerical figures exactly how many people are benefiting from yoga around the world. But one can easily notice that a huge number of people especially the women have been practicing yoga daily. The participation of a huge number of women itself signifies how important the yoga is for the health and the happiness. This trend also recommends that yoga must be taken seriously into the consideration as a part of workplace curriculum or culture to promote CW, CE and corporate social responsibility (CSR).

The CY will consists of normal subtle yogic warming up exercises, postures, yogic breathing exercises(*pranayama*), gestures, psychic locks, concentration, meditation, and spiritual counseling. CY can be taught collectively and practiced individually in order to gain its wholesome effects. Impacts of CY practices can be better explained via bio-psycho-socio-spiritual model- at physical level it improves musculoskeletal functioning, cardiopulmonary status, ANS response and endocrine functioning; at psychosocial level, it enhances self-esteem, social support and positive mood; and at spiritual level it elevates compassionate understanding and mindfulness.

The progress of CY practice will positively produce prolonged physical, mental, emotional, social and spiritual effects on executives. This will also help in producing effective leadership in corporate world. Nurturing effective leaders is one of the most important functions of the corporate excellence. This aspect also can be achieved by persistent practice of CY. There is no other method better than yoga that can make a corporate executive physically fit, mentally alert, emotionally rectified, socially adapted, rationally positive, completely self analytic and spiritually elevated.

Particularly, work related stress, respiratory problems, cardiac problems, digestive problems and genitourinary problems are seen improved by the specific and regular yoga practice. Mechanisms underlying the modulating effects of yogic cognitive-behavioral practices (eg, meditation, *Asanas*, *Pranayama*, caloric restriction) on human physiology can be classified into four transduction pathways: humoral factors, nervous system activity, cell trafficking, and bio-electromagnetism that shed light how yogic practices might optimize health, delay aging, and ameliorate chronic illness and stress from disability (illness and stress from disability). That implies that yoga is a cost effective and common avenue to minimize medical expenditure and maximize corporate performance and productivity.

Promotion of total health, happiness, harmony and four human intelligences- rational intelligence, creative intelligence, emotional intelligence and spiritual intelligence are side benefits of CY practice. Scientific validation and standardization of the effects of yoga practices at individual and corporate level follows bio-psycho-socio-spiritual research model and substantiate efficacy of CY for CW and CE. The general mechanism of yogic effects and efficacy of yoga for managing work stress, and improving health problems related to stress, respiratory, cardiopulmonary, digestive and genitourinary systems in organizational family is portrayed on the basis of concerned research findings. Regular practice of yoga or CY culture is directly linked to wellness and optimal intelligences of organizational family. Good employees' health leads to productivity at work, productivity at work leads to business competitiveness, business competitiveness leads to economic prosperity and well-being which is again associated with employees' good health.

Cognitive intelligence that can be slightly enhanced and maintained through yoga practice is helpful for sound managerial capabilities and technical skill empowerment. Creative intelligence and concentration promoted by yoga practice is supportive for the generation of creative and innovative ideas. Emotional intelligence that can be remarkably increased by yoga practice is the key for galvanizing leadership, team building, optimal interpersonal relationship and harmony. Spiritual intelligence that can be increased subsequently via yoga practices is near to the corporate social responsibility, holism, empathy, farsightedness, compassion and universal love. Thus, it can be concluded that CY is a cost-effective, eternal and universal means for workplace wellness and excellence that needs to be included as an indispensable part of corporate culture.

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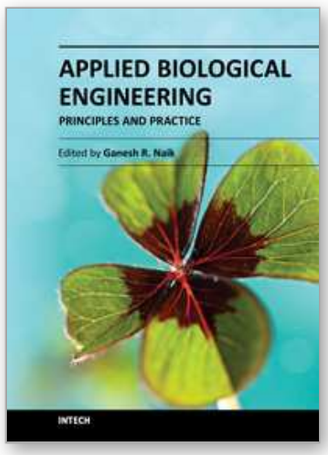

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Biological engineering is a field of engineering in which the emphasis is on life and life-sustaining systems. Biological engineering is an emerging discipline that encompasses engineering theory and practice connected to and derived from the science of biology. The most important trend in biological engineering is the dynamic range of scales at which biotechnology is now able to integrate with biological processes. An explosion in micro/nanoscale technology is allowing the manufacture of nanoparticles for drug delivery into cells, miniaturized implantable microsensors for medical diagnostics, and micro-engineered robots for on-board tissue repairs. This book aims to provide an updated overview of the recent developments in biological engineering from diverse aspects and various applications in clinical and experimental research.

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