Chapter 1

Introduction
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The present trend of the thought based on a materialistic philosophy of power, prosperity and pleasure has resulted in a form of sensate culture. Worldly values dominate the modern man who reacts to stimuli and struggles for self-preservation, self-aggrandisement and self-gratification. This ego ridden individual seeks freedom and happiness in his nerve-racking hunt for worldly objects which leads to a life of bondage, misery, worries, insecurity, despair, frustration, disillusionment and doubt. The modern man has sold himself to gain reputation, personal power, more money and other selfish ends; he is caught in never-ending mad rush to meet all kinds of unrestrained needs which wear and tear out, his vital organs much sooner. Due to his abnormal living habits, and a exciting, straining life his emotional balance is disturbed. Emotional disturbances can upset glandular functions, metabolic balance and also cause stomach distress. There is a growing awareness of the importance of emotional factor involved in the activities and efficiency of the cardiovascular system. All these reactions really depend on our personality, temperament, emotional stability and attitude, which ultimately determine our stress threshold.
"Men are not disturbed by things, but by the views they take of them" (Epictetus. A.D.60.)

Clinical psychologist, Elbert Ellis, suggests that some commonly held beliefs are irrational and self-defeating because they lead to unnecessary emotional distress (Ellis & Grieger, 1977). The most basic belief among them is perhaps that it is terrible and catastrophic when things and people (including ourselves) are not the way we expect them to be. Irrationality of this idea is seen by Ellis in two ways. One, things are seldom awful or catastrophic (They are merely annoying and frustrating) two, it is self-defeating to turn our preferences and wants into absolute necessities. People who think in this manner tend to overreact with strong negative emotions of anger, depression and fear, when things or people are not necessarily the way they are expected to be.

External as well as internal stimuli may trigger our emotional responses. It is easier to identify the external events and situations that influence our emotional states and resulting behavior but it is more difficult at time to identify the source of internal distress. At a time or other, all of us may have felt anxious or 'down in the dumps' without knowing why.
When our emotions are stirred up the resultant physiological arousal is obviously noticeable. Many parts of the body are involved in emotional arousal. Psychophysiologists consider the nervous system and endocrine system as especially significant in producing the physiological arousal that is identified with emotions.

Increased activity of the sympathetic nervous system helps the body in dealing with threatening situations like an emergency reaction or the flight or fight response. In contrast to the emergency reaction the pattern of bodily response during relaxation includes decreased activity of the sympathetic and somatic nervous system with increased parasympathetic activity. This is the maintenance system of the body, which is responsible for conservation and replenishment of energy. Both of them are parts of autonomic nervous system. One part, the sympathetic system, is active during arousal states and prepares the body for extensive action by increasing the heart rate, raising blood pressure, increasing the blood sugar level and raising the levels of certain hormones in the blood. This part of autonomic nervous system is active while we experience strong emotions such as fear and anger.
The other part parasympathetic of the autonomic nervous system tends to be active when we are calm and relaxed. It helps to build up and store the body's energy. For example, it decreases the heart rate, reduces the blood pressure and diverts blood to the digestive system. In aroused emotional states, sympathetic activity dominates, in calm state, parasympathetic activity is more prominent. But both systems can be active in many emotional states; for example in anger, heart rate increases, a sympathetic effect and so do digestive activity a parasympathetic effect. Over stimulation of the endocrine glands and the nervous system results in the impairment of physiological functioning expressed in terms of somatic malfunctioning.

This relationship between mind and body has fascinated philosophers and scientists throughout history. It was believed that person's mental state and physical activities were parts of an individual whole. The prevailing cultural model defining the relationship of body to consciousness tends to be reflected in disease model. Consciousness, feelings and thoughts have been conceived of an epiphenomena of physical process. In historical perspective, these hypothetical constructs formed the foundation of psychosomatic diseases and medicine. Now the balance has shifted from
constitutional and genetic factors towards the recognition of psychogenetic factors in mental and physical disorders. Today exciting research in psychoimmunology, neuroendocrinology, and neurophysiology is encouraging us to take a new look at the mind-body relationship, particularly at the issue of how psychological stress can cause pathological changes in body functions. Stress produces not only compensatory behaviours but emotional and physiological reactions as well. It contributes to change in body functions, which if intense or chronic may lead to disease. Meyer (1958) long back argued that alteration in social circumstances and behavioural patterns have potential influence on the balance in health and illness. The psychophysiological studies established that natural or induced stress evoke significant alterations in the functioning of most bodily tissues, organs, and systems. These changes in turn lead to a lowering of the body's resistance to disease. The greater the magnitude of such stressful life events, the greater the risk of acquiring of illness of serious nature (Holmes, 1974, Rahe, 1964, 1968). By engaging important integrative system of the body, stress can cause disease by: lowering of immune response; creating endocrine problem; altering the balance of autonomic control; altering sleep pattern with attendant impact on protein metabolism, hormone secretion, and other vegetative functions; changes in
peptide release in extra CNS sites; and affecting neurotransmitter, neuromodulator, and neuroendocrine functions of brain.

In numerous studies a positive relationship has been noted between psychological and physical stress and a variety of psychological and somatic disorders. Stress researchers in India as well as abroad have reported significant positive relationship between psychological stresses experienced by people in their different life domains and various symptoms of psychosomatic disorders. A variety of somatic problems, particularly psychosomatic disease, have been observed to be the outcomes of severe stresses experienced by people in their physical environment and their social and occupational life domains. In some investigations, even cancer has been reported to be an outcome of the biochemical reactions to the situations of severe stress.

Jons F.N et.al 1956 described psychosomatic as 'Psyche' and 'Soma'. the Greek words meaning the mind and the body respectively. So psychosomatic disease are those diseases which, while they have their origin in the psyche, are clinically diagnosed through somatic symptoms manifested in the body. They are now also called stress diseases expressed through psychophysiological reactions. In simple words, they are mind to body problems, which have simultaneous
interaction and mutual influence. Generally, it is believed that emotional effects, caused by the stress and tension of modern life, are translated into somatic disorders such as coronary heart disease, hypertension, diabetes, peptic ulcer, insomnia, and disorders of the digestive system, etc. At least 72 percent of diseases in metropolis cities are psychosomatic disease or stress diseases, associated with mental or emotional disturbances.

Keeping in view the objectives of the study it is pertinent to define and describe the psychosomatic disorders undertaken in the study.

**Coronary Heart Disease:**

Coronary heart disease has been defined as impairment of heart function due to inadequate blood flow to the heart, compared to its needs, caused by obstructive changes in the coronary circulation to the heart. Studies have identified, several 'risk' factors e.g. raised serum cholesterol (L.D.L.), hypertension, diabetes, physical inactivity, obesity, and continuous stress condition.

Today, there is a vast body of evidence showing a triangular relationship between habitual diet, blood cholesterol-lipoprotein levels and CHD and, that there relationship are judged to be causal one (WHO 1982 Techn. Rep). There is no population, in which CHD is
common, that does not also have a relatively high mean level of cholesterol (i.e. greater than 200 mg % in adults.)

Study shows that risk of CHD rises steadily with the serum cholesterol concentration. The 10 years' experience of the seven countries study showed that serum cholesterol concentration is an important risk factor for the incidence of CHD at levels perhaps 220 mg % or more. (Kannel. W.B. (1976). Am. J. cardiol., 37: 269).

When we look at the various types of lipoproteins, it is the level of low-density lipoprotein (LDL) cholesterol that is most directly associated with CHD. While very low-density lipoprotein (VLDL) has also been shown to be associated with premature atherosclerosis, it is more strongly associated with peripheral vascular disease (e.g., intermittent claudication) than with CHD. High-density lipoprotein (HDL) cholesterol is protective against the development of CHD-the higher its mean level in a group of individuals, the lower the incidence of infarction in that group .HDL should be more than 30 mg %.

To further define CHD risk prediction based on serum lipid levels, a total "Cholesterol HDL ratio" has been developed. A ratio of less than 3.5 has been recommended as a clinical goal for CHD prevention (Gordon, T. et al 1977. Am. J. med, 62: 707) The normal
value of LDL is 80 -170 mg%. The normal value of HDL is 30 - 70 mg %.

The blood pressure is the single most useful test for identifying individuals at a high risk of developing CHD. Hypertension accelerates the atherosclerotic process, especially hyperlipidemia is also present and contributes importantly to CHD. In the past, emphasis was placed on the importance of diastolic blood pressure. Many investigators feel that systolic blood pressure is a better predictor of CHD than is the diastolic. However, both components are significant risk factors. The risk role of "Mild" hypertension is generally accepted (WHO 1985 Primary prevention of CHD EURO Dep and studies 98. copenhagen).

The risk of CHD is 2-3 times higher in diabetics than in non-diabetics. CHD is responsible for 30 to 50 percent of deaths in diabetics over the age of 40 years in industrialized countries. WHO (1985) Techn. ReP. Ser 727.

Sedentary life-style is associated with a greater risk of the development of early CHD. This evidence that regular physical exercise increases the concentration of HDL and decreases both body weight and blood pressure which are beneficial for cardiovascular health, (Miller, N.E. et. al.1979. Lancet 1:11)
Type A behavior is associated with competitive drive, restlessness, hostility and a sense of urgency or impatience. Type A individuals are more CHD prone than the calmer. (Jenkins, C. D. et.al. (1974) N. Eng. J. Med., 290 1271.)

Hypertension:

Hypertension refers to high blood pressure, both systolic and diastolic. At the time when heart contracts the blood is pumped into arteries with a particular pressure known as systolic pressure, whereas when heart relaxes or comes back to its original shape the blood pressure in the arteries drops down to a particular level which is known as diastolic pressure. The ideal pressure is 120/80 mmHg possible completely at rest and free from tension range. An individual is said to suffer from hypertension if the blood pressure is persistently above 150/90 mmHg. However the aim of treatment is to have blood pressure below 140-90 mmHg.

Hypertension is of two types primary and secondary. Primary hypertension is also called essential or idiopathic No specific cause for the rise of blood pressure is detected. The essential hypertension is associated with continuous tension, mental strain or anxiety. Primary hypertension is thus a stress disorder. In the present day of world, the chances of being under continuous strain are pretty high
for each one of us due to fast, uncertain, crowded and tense way of daily life. Filled as it is with conflict, competition, unkindness and cruelty. That is why the incidences of hypertension and more serious heart ailments are extremely high today, as compared to the days of our ancestors, two or three generations ago, secondary hypertension is caused as a side effect of major disease of other organs like kidneys endocrine glands or brain.

**Diabetes Mellitus:**

It is a devastating medical condition-affecting people of all ages, genders, and nationalities. Diabetes is the inability to bring glucose from the blood to the cells. This abnormality is due to either a decrease in the production of insulin by pancreas or an insensitivity of cells to respond to the insulin present.

Stress and anxiety for imaginary reason, fear from unknown source and above all sedentary urban life style aggravates this disease among the urban population.

Normally, the blood glucose level is 90 to 110 mg%. The blood sugar levels of diabetes patients are abnormally high ranging from above 150 mg% to 300 mg% in mild cases. In extreme cases it may go up to 800 mg%.
**Peptic ulcer:**

Peptic ulcer is defined as disruption of the mucosal integrity of the lower end of esophagus, stomach and/or duodenum due to hypersecretion of acid and pepsin leading to a local defect. In peptic ulcer personality there are psycho-physiologic gastro-intestinal reactions to life-situations. It is said that a feeling of strong resentment, sustained hostility and anxiety (due to parasympathetic over compensation) results in a perceptible increase of acid production (HCL) which eats away the stomach lining or the lining of the duodenum, or lower end of esophagus leaving a kind of wound. (Asif Golwalla F. 1997).

**Insomnia:**

It is a psychophysiological disorder in which there is a preoccupied perception of inability to sleep at night, initially triggered by stressful event and mostly due to anxiety and unpleasant emotions going out of hand. Shocking news, situations causing disappointment and frustration of desire, fear of loosing money, prestige or position, or strain of work over long periods may cause insomnia by constantly stimulating the wakefulness center in the hypothalamus and the reticular system of the brain. When disturbing factors keep on influencing one's mind one cannot sleep well.
Several attempts have been made in the past to show the relevance of yoga in psychotherapy (e.g., Ajaya, 1983; Coster, 1934; Rao, 1995; Vahia, 1969; Watts, 1961). However a system of psychotherapy based on yoga is yet to be formulated and practiced. The increasing popularity of yoga in the treatment of psychosomatic disorders both in mainstream medicine and in alternative medical circles and the interest of psychologists in meditation and yogic relaxation methods, necessitate a close examination of the conceptual framework and repertoire of practices of yoga for their relevance to psychotherapy.

The practice of Hatha yoga had proved to be of great help in the treatment of certain ailments as shown by scientific investigations carried out in India and elsewhere. It is a way of achieving perfect health of all parts of the body and influencing breathing and other functions going in it and through them bringing a perfect harmony in mental and physical activity. It helps to prepare a healthy body and mind in such a way that a necessary equilibrium is established in over all functions. (Hatha Yoga, Rarmacharaka yogi 1977).

Yogic asanas involve symbolism and body language. The characteristic feature of asanas is that several of them involve
stretching of the musculature and exerting pressure or squeezing of the bodily parts, providing exercise to the joints, muscles and internal organs. There are specific asanas to selectively exercise chosen areas and organs of the body. Asanas contribute to the health and vigor of the whole body. Both the voluntary and involuntary systems of the body are exercised in asana practice.

In practicing asanas attention is paid to the sensation generated by the movement as well as to the stillness. Coordination of breath with movement is also emphasized. As a result body awareness increases and the practitioners become sensitive to the inner processes (Jhansi Rani & Rao, 1994).

As emotions often reflect in the body, asanas provide a means to deal with the emotional blocks and characterological muscle tensions. A regular practice of asanas may be helpful to change the dispositions and attitudes that lead to maladjustment in the life. For example, posture of strength (vajrasana), posture of attainment (siddhasana), posture of a hero (dhirasana) among others, may help to bring about a change in the attitudes of the individual. Relaxation postures such as shavasana and makarasanas, and asanas that involve concentration on specific muscle groups of the body may help to overcome tensions and restlessness. Yogic relaxation postures have
already been found in systematic research to reduce anxiety, psychosomatic complaints and repressed emotionally (e.g., Ajaya, 1984, Patel, 1973, Vahia, 1973, Neurenberger, 1981).

In his foreword to B.K.S. Iyengar's Light on Yoga, Yehudi Menuhin (1964) observed that yoga induces in the practitioner a primary sense of measure and proportion. It refines and animates every cell of the body unlocking and liberating capacities such as strength of will, impetus, ambition and tenacity. Yoga is ideally suited to prevent physical and mental illness and to protect body, generally developing an inevitable sense of self-reliance and assurance. According to yoga once the mind becomes calm and steady, clarity improves and person becomes more aware of the forces which bring about disturbances. He is thus mentally better equipped to deal with any situations with a tranquil mind. He remains unperturbed in difficult situations, even when the external factors have not changed.

According to Swamy Ajaya (1983), who first dealt with asanas at length for their relevance to psychotherapy noted that the asanas have all the properties of modern psychophysical disciplines such as bioenergetics, chiropractice, rolfing and massage therapy.
There is also little doubt that proper habitual exercise training program is a significant factor in reducing the severity of psychosomatic disorders. The coronary artery disease graph from 1960 had steadily declined to 25% and it is believed to be due to a combination of improvement of treatment and primary prevention program. Which includes exercise (Fox, Bower & Foss 1989). Many studies have been conducted to infer that exercise and CHD are related. One of the first studies to infer that exercise and CHD are related was done in 1953 in England on groups of bus drivers and bus conductors. The result showed that the incidence of heart disease in the sedentary bus drivers was twice that of the more active bus conductors. While the drivers sat most of their working day, the conductors walked up and down the double-decker buses. Since this study nearly 35 years ago, many similar studies using different groups of subjects have come to same conclusion: that the risk of heart attack is less the more physically active you are.

Recent researches has shown that exercise not only lower total blood cholesterol but also increases the fraction of cholesterol known as HDL which is protective against CHD as it do not collect or adhere to the inner linings of arteries. Infect it help in breaking down the fatty deposits already present. The fatty atherosclerotic deposits
are composed of LDL and VLDL, these are decreased by long term aerobic exercise.

High blood pressure or hypertension is another risk factor associated with coronary heart disease. An individual with a systolic blood pressure of 150 mmHg has over twice the risk of CHD than does someone with a pressure below 120 mmHg. Habitual exercise has been shown to be effective in reducing blood pressure to nearly normal values (Fox, Bowers and Foss 1989).

Infact the 1984 data of Paffenbarger and colleagues suggested that physical activity benefits may not be limited to the primary prevention of coronary heart disease. They show that persons who exercise also have a lower incidence of stroke, respiratory disease, all cancers and deaths from all causes than persons who do not exercise. A more recent report about this subject group indicates that exercise participation lengthens life span.

Exercises are divided into aerobic and anaerobic groups. Anaerobic physical activity is done in the absence of O₂ where as aerobic physical activity is done in the presence of sufficient oxygen for metabolic reactions.

Aerobic activity is usually exercise done with intensity, hard enough to achieve the target heart rate of 60% to 65% of one's
maximum heart rate and one's metabolic rate is between 50% to 60% of max \( \text{vo}_2 \) for prolonged periods of times. During which constant supply of \( O_2 \) is maintained by the circulatory system to the working muscles in order to metabolise carbohydrates and fats for the production of energy. Thus during aerobic activity, the heart, lungs and blood vessels supply \( O_2 \) and nutrients to the muscle cells to meet the demand of long duration physical activity. Because of the importance of the total fitness effect and the fact that it is more readily attained in aerobic exercise programs and also because of the potential hazards and compliance problems associated with high intensity anaerobic activity lower to moderate intensity of longer duration aerobic activity is recommended for the non athletic individuals.

After thoroughly reviewing the available literature, we have come to the conclusion that several studies had been conducted to ascertain the effect of yoga and exercise separately on psychosomatic disorders separately, but not much studies on combined effect of yoga and exercises on psychosomatic disorders had been carried out till now. The purpose of this research was to place the role of yoga and exercise jointly and individually in controlling significantly the
psychosomatic disorders based on a distilled and detailed interpretation of the gathered data.

The Statement of the Problem:

The statement of the problem is "Comparative effect of aerobic exercises and selected yogic practices on the psychosomatic disorders."

Hypothesis:

Keeping in view the objectives of the study following hypotheses were formulated:

1. It is hypothesised that Yogic and Aerobic exercise programmes would significantly medicate the psychosomatic disorders.

2. It is hypothesized that Yogic programme would be more effective than Aerobic exercise programme in medicating the psychosomatic disorders.

3. It is further hypothesized that a Combined Aerobic-Yogic exercise programme would be more effective in medicating psychosomatic disorders than the individual programmes of Yoga and Aerobic exercise.
Limitations:

1. The variation in the age group of subjects might have some infringement on the findings of our study.

2. Though every effort was made to control dietary and living habits but even than some minor variation in them might have created some infringement on the findings.

3. Though it was intended by us to keep a control group, which was not to be subjected to any experiment programme, but we could not manage the control groups. As all the subjects of control group withered away in search of other treatments. Therefore for inferring the level of improvement in the chosen variable of various psychosomatic disorders we had also used paired t-test to determine significance of difference between pre and post test means along with analysis of variance and covariance.

Delimitation:

1. The study was delimited to the subject of both sexes with age group ranging from 20 to 50 years.

2. The study was delimited to selected Psychosomatic disorders
   (a) Coronary heart disease (LDL, HDL)
   (b) Hypertension
(c) Diabetes
(d) Peptic ulcer
(e) Insomnia

3. The Study was delimited to specific yogic programme including asanas, pranayam, kriyas, yog nidra, and Transcendental Meditation Techniques.

4. The Study was delimited to selected aerobic exercises programme of 35 to 60 minutes. The intensity of the programme was set on a point, where by the heart rate of the subject was between 50-60% of his maximum heart rate.

Significance of the Study:

The significance of the study lies in finding out the medication of psychosomatic disorders through yoga and physical activity. The study will help us to know the effect of yoga and aerobic activity in improving somatic functioning of the individual by relieving his various psychiatric disorders. It will also help in establishing the relationship between one psyche and his organic functional activity.