PSYCHOLOGICAL DYNAMICS OF ASTHMA IN RELATION TO VARIOUS ETIOLOGICAL AND THERAPEUTIC APPROACHES AND PROGNOSIS

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by

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CERTIFICATE

This is to certify that the thesis entitled **PSYCHOLOGICAL DYNAMICS OF ASTHMA IN RELATION TO VARIOUS ETIOLOGICAL AND THERAPEUTIC APPROACHES AND PROGNOSIS,** submitted by **Mr. VEERAMANIKANDAN N.,** to the Department of Psychology, University of Calicut, is a record of bonafide research work carried out by him under my supervision and guidance. The results embodied in this thesis have not been submitted to any other University or Institution for the award of any degree or diploma.

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DECLARATION

I, **VEERAMANIKANDAN N.**, do hereby declare that this work reported in the thesis entitled **PSYCHOLOGICAL DYNAMICS OF ASTHMA IN RELATION TO VARIOUS ETIOLOGICAL AND THERAPEUTIC APPROACHES AND PROGNOSIS** is original and carried out by me in the Department of Psychology, University of Calicut, under the guidance and supervision of **Dr. J. BABY.** I further declare that this thesis or any part of this has not been submitted for any degree, diploma, recognition or title in this or any other University or Institution.

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dedicated to my
beloved father
who left us after
prolonged suffering
from
bronchial asthma

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CHAPTER I

INTRODUCTION

INTRODUCTION

Health Psychology is devoted to understanding psychological influences on, how people stay healthy, why they become ill and how they respond when they are ill. Health Psychology is concerned with all aspects of health and illness across life span. It focuses on health promotion and maintenance. Health psychologists also study the psychological aspects of prevention and treatment of illness, the etiological and correlatives of health, illness and dysfunction (Taylor, S.E., 2006).

Health psychologists analyses and attempt to improve the health care system and the formation of health policy. The present study follows a biopsychosocial model which is very much in agreement with the holistic health concept.

Biopsychosocial model

The biopsychosocial model considers the interacting role of biological, psychological, and social factors .in assessing an individual's health and illness, recommending treatment, and patient practitioner relationship (Taylor, 2006).

The present study deals with a disease namely bronchial asthma which is one of the leading health problem all over the modern world. The study attempts to examine the etiological foundation of medicine and the alternative and complimentary medical systems, so as to arrive at the psychodynamics of asthma and its remedial measures.

Psychosomatic Disorder

The notion that psychological and emotional factors can contribute to physical aliment is older than history. (Kaplan, 1985) Pre-historic humans saw disease as spiritual as well as physical and many cultures in ancient history include psychological and social factors in their views of disease. Freud emphasized the importance of unconscious psychological factors in the development of physical symptoms (Brannon L. and Feist. J, 1992).

The physical illness which have emotional and psychological components; these psychological and somatic factors interact to produce disease, which are generally known as psychosomatic disorders.

Psychosomatic Disorders are physical disorders which are caused by or exacerbated by psychological factors. The psychological factors fall in to three major groups: stress resulting from encounters with the environment, personality characteristics and psychological states. It should be noted that psychosomatic disorder are different from two other condition with which hey are often confused. Psychosomatic disorders are real- that is they are actual physical illness that have underlying psychological causes or that are made worse by psychological causes or that are made worse by psychological factors.

Psychosomatic disorder can affect any of the organ system of the body, certainly not all physiological disorders or illness is psychosomatic disorders. There are many familiar and common psychosomatic disorders that can affect the body's various organ systems.

The research base for psychosomatic disorder began with Walter Cannon's observation in 1932 that physiological changes accompany emotions (Kimbal, 1981). According to Cannon emotions could cause physiological changes that might be related to the development of physical disease; that is emotion can causes changes that in turn could cause disease.

In DSM IV, Psychosomatic disorders are referred to as psychological factor affecting physiological conditions. Studies show that psychosomatic disorders can affect any of the organ systems of the body. It does not mean that all physical disorders or illness are psychosomatic disorders certainly not all psychological disorders or illness are psychosomatic disorders.

The Ninth International classification of disease provides a comprehensive list of psychosomatic disorders. Bronchial asthma is listed among the seven psychosomatic disease along with essential hypertension, peptic ulcer, rheumatoid arthritis, hyper thyroidism, colitis, and neurodermatitis. Sufferers of psychosomatic illness are experiencing pain, nausea, or other physically felt symptoms, but with no physical cause that can be diagnosed.

Bronchial asthma is an inflammatory disorder of the airways, which causes attacks of wheezing, shortness of breath, chest tightness and coughing (Bethesda, 2003). It is a disorder of the upper respiratory tract involving the lungs and the bronchi. Asthma episodes can be triggered by a variety of factors. It is not clear exactly what makes the airways of people with asthma inflamed in the first place. An inflamed airways may be due to a

combination of things. New research suggests that being exposed to things like tobacco smokes, infections, and some allergens early in life may increase the chances of developing of asthma.

There are things in the environment that bring asthma symptoms and lead to asthma attacks these triggering factors that produce asthma attack are change of seasons, hereditary factors ,allergens ,irritants, emotional factors infections and nutrition. Some people have asthma only when they have an exercise or have an infection.

The following list gives some examples of things that can bring or trigger asthma symptoms:

Allergens

Animal dander (from the skin, hair, feathers of animals)dust mites (contained in house dust), cockroaches and pollens from trees and grass.

Irritants

Cigarette smoke, pollutions cold air or changes in weather, strong odors from paintings or cooking, scented product, strong emotional expressions (Including crying and laughing hard) and stress.

Others

Medicines such as aspirin and beta blockers, sulfites in food (dried fruits or beverages wine),condition called gastro esophageal reflex diseases etc. are the other causes.

Nagendra and Nagaretna (1998) reported that one percent of Indians have asthma and more than five percent of world population have asthma symptoms and many among the asthmatics need medication.

In spite of the intense research in modern medicine and other areas man has not yet been able to get the final answer to the causation of asthma. Asthma is symptom and not a disease. It is not a contagious disease.

The knowledge about the pathogenesis of asthma has clearly pointed out that the defect is the hyper responsiveness of the bronchus. The air passages express excessive response by spasm to all sorts of stimuli, external or internal like allergens, chemicals, cold air, fumes, atmosphere, humidity, temperature or exercise and emotion. The cause of the hyper responsiveness is the autonomic imbalance.

Types of Asthma

Bronchial asthma can be generally categorized in to two as extrinsic asthma and intrinsic asthma (Jaggi O.P., 1985).

Extrinsic Asthma

This types of asthma occurs in the early period of life and it is intermittent to begin with. Patients have an inherited liability to develop asthma when exposed to allergic agents like pollens, house dust, certain fungi, insects, danders, feather, chemicals, drugs etc.

Intrinsic Asthma

This type of asthma occurs in the later period of life in which the patient do not seem to have an allergic background, but develop the disease because of some pre-existing disease of the lung such as past infections or existing disease like chronic bronchitis. The asthma attack is more frequent and severe.

Distinguishing asthma from chronic bronchitis and emphysema is difficult among the elderly patients. Sometimes asthma and chronic bronchitis may co-exist in a patient. A patient may begin with asthma because of an allergy to pollens etc., and if improperly or inadequately treated he may develop chronic bronchitis and after many years, develop so called intrinsic asthma, without any apparent allergic background or known cause and end up as a case of emphysema.

Cardiac Asthma

Cardiac asthma is a critical disease which simulates bronchial asthma. In this condition the breathlessness is primarily due to heart disease. An attack, usually rises to a peak, is accompanied by difficulty in breathing both during inspiration and expiration, and frequently by a terrifying sense of suffocation which cause the patient to sit up or stand erect and even to go to window for air. The attacks last from a few minutes to a few hours, averaging about an hour, and leave the patient in an exhausted condition for hours or even days. Cardiac asthma is precipitated by acute failure of the pumping action of the left ventricle of the heart. It is a common feature with hypersensitive heart disease and coronary artery disease.

In an asthma attack, the presence of cardiac asthma should be suspected if the patient is more than forty years old, and the patient has a history of hypertension or heart disease besides that if the patient is sweating profusely and seek fresh air and a fear of death can be suspected.

Hysterical asthma

In some patients, particularly young girls, claim the complaint of asthma but history and examination reveal that all they have is sighing respiration there is no wheeze and no difficulty in either breathing in or breathing out. These kind of asthma without any kind of physical symptom are hysteric asthma.

Exercise Induced Asthma (EIA)

Another type of asthma which occurs in some people after taking exercise called exercise induced asthma. This occurs more commonly when physical exercise is done in cold weather.

Exercise induced asthma is a temporary increase in airway resistance following vigorous physical activity. Airway obstruction begins shortly alter cessation of exercise and reaches its peak in 5 to 10 minutes. Most of the patients recover completely in 30 to 60 minutes, but in a few patients the attack remains for several hours after the initial response subsides.

It is generally accepted that EIA is a result of thermodynamic events transpiring within tracheo-bromchial tree during or after hyper ventilation. During exercise, hyper ventilation leads to a fall in airway temperature and respiratory water loss. Mouth breathing because of increased oxygen demand during exercise further aggravates by passing the nasal air-conditioning mechanism. It is assumed that rewarming of the airway that occurs following cessation of exercise precipitates the broncho constriction.

Nocturnal Asthma

Pulmonary function shows circadian rhythm in normal subjects as well as in patients suffering from asthma. Staudinger and Steirjans showed poorest airway function during the night and best during the midday and evening. Another study by Turner-Warwick (1988) has shown frequent occurrence of nocturnal symptoms in asthmatics. Furthermore, patients with asthma show a greater bronchial reactivity at 4AM when compared to

at 4 P.M. Further, it has been seen that majority of deaths due to asthma occur most often at night. (Kumar. S. *et.al*., 1997).

Presently, mechanism involved in nocturnal asthma are not fully understood. However, a multiple factors seem to interact in nocturnal asthma. In allergic individuals, allergen exposure during evening hours initiates a cascade of events to produce a bronchoconstriction during night. Lowest serum levels of epinephrine and cortisole, and highest serum histamine during night hour could be responsible for nocturnal episodes in asthmatic individual.

Besides the above types, diseases which at some stages may simulate bronchial asthma are malignant tumors of the chest, such as lymphosarcoma and Hodgkins's disease. Pressure of enlarged glands in lung cancer may give rise to wheezing and breathlessness. The same may happen with the dialation and swelling of the wall of the aorta in the chest, which carries pure blood from the heart for the rest of the body.

Conditions that influence Asthma

Bronchial asthma is a reversible obstruction of the airway, not due to any other disease. Changes in the immune and in the control of the diameter of the airways are probably responsible of attack of wheezing (Corsim. R,J. 1994) . Individual with sensitive bronchi (airway tube) are subjected to different stresses such as heredity, inhalation of irritants and allergens, respiratory infections, changes in climate and emotional factors. These are all situational aspects but not proved to be the causes.

Psychological factor are not primary cause, but they may aggravate the symptoms (Nagendra, 1998).

Heredity

Asthma occurs more often in persons who have a family history of the disease. The greater the degree of inheritance, the greater the likelihood of the offspring's becoming sensitive. Furthermore when both the parents are affected by asthma, the disease in the children appears earlier, and often before puberty.

Allergies

Not everyone who has asthma is allergic. However, allergy can without question play a role in asthma symptoms for some individuals. The pattern and timing of the patient's asthma symptoms often provide clues suggesting that allergy may be causing the asthma. Seasonal pollens from trees and grasses in the spring and ragweed in the fall can precipitate an asthma episode during those times of the year. Exposure to dog or cat dander, feather pillows, dust and molds can all precipitate the symptom. (Weinstein, A.M. 1987)

Infection

It has been observed that, many a time after a throat infection, a child becomes breathless, has wheezing sound, in the chest and presents a clinical picture of asthma. When the infection subsides the chest return to normal condition. Such symptom may recur afterwards.

Childhood infections, such as measles pneumonia, whooping cough or infection in the tonsils and adenoids can set up symptoms of asthma in an already predisposed child. A pre-existing sensitivity to a specific allergen may become manifest in the presence of infection

Climate and physical variables

Climate has a major role is aggravating asthma symptoms. Generally a dry climate is better suited to an asthmatic than a humid one, and he feels better away from a sea cost than near it. Rainy weather with its increased humidity is troublesome to some asthmatics; but patients who are allergic to pollen feel better after a rain, as all the pollens present in the air get washed down.

It has been observed that many asthma patients do not develop symptoms when they go to hill stations. Decrease in atmospheric pressure and other atmospheric conditions have positive impacts on the asthmatic patients.

Altitude

It has been observed that many asthma patients do not develop symptoms when they go to hill stations. Decrease in atmospheric pressure and other atmospheric conditions have positive impacts on the asthmatic patients.

Wind

Some patients experience difficulty when a wind from a particular direction starts blowing. It is probable that the wind picks up pollens in its path, to which the patient is sensitive and when the patients is exposed to it, gets the symptoms of asthma.

Barometric pressure

A sudden drop in barometric pressure, as happened immediately before a thunderstorm is unsuitable to an asthma patient. May be a sudden change in the mobility of the body fluids may cause disturbances.

Occupation

Some occupations are particularly hazardous for people with an allergic background or for those who have some manifestations of allergy already in them. Farmers, paultry-man etc. are exposed to large quantity of dusts and danders and such patients who already has asthma may lead to an aggravation of the symptoms.

Emotional state and asthma

Any excessive emotional reactions produced by anxiety, stress, fear, anger etc. may sometimes precipitate an attack of asthma in a person who is already predisposed to it. When a person with asthma laughs, yells, or cries hard natural airway changes may cause wheezing or asthma symptoms. It has been observed that some asthmatic children when sent to hostels show a decrease in their symptoms. This may be due to the child being rid of the emotional problems that surround him at home (Jaggy, 1985). Asthmatics are characterised by dependence, anger or fear and consistently report their

inability to express their feelings. Repressed anger is very much associated with asthma. Nagendra (1998) elaborates that asthmatics are psychologically very sensitive and meticulous. This leads to psychological hypersensitivity and deep rooted conflicts and emotional suppression. Either they burst out as greed, anger, jealousy etc. and form an important source of stress, which can lead to actual tissue damages as in many psychosomatic illness.

The exact etiology of asthma is yet to be investigated. It is clear that the problem is hyper responsiveness of the bronchi, due to autonomic imbalance. Stimulation of the parasympathetic nervous system results in to bronchial constriction while the sympathetic causes bronco dilations (Nagendra.H.R, 1998).

Asthma and the Ayurveda

Ayurveda is a traditional health care system of India, based upon Indian philosophical, medical and psychological concepts. *Ayur* in *Ayurveda* means ' life' and ' *Veda*' knowldge *Ayurveda* is a science of living a healthy long life.

Ayurveda maintains that good health exists when the body, mind, spirit and environment are in harmony. Proper diet, exercise, a balanced life style mediation and psychological wellbeing go a long way towards sound health. It deals not only with what is to be done when one falls ill, but also with what should be done to maintain one's health and vigor.

According to ancient Indian philosophy, the universe is composed of five basic elements or *Pancha bhutas*: *Prithvi* (earth), *apa* (water), *teja* (fire), *vayu* (air) and *akash* (ether). Everything in the universe, including food and the bodies we posses, are derived from these *bhutas*. A fundamental harmony therefore exists between the macrocosm (the universe) and the microcosm (the individual). The human being is comparable of the cosmos, being a minuscule image of the great entity (Murthy N.A. and Pandey. D.P, 1982).

Ayurveda emphasise that a healthy person is sound in his body ,mind and soul. Anything short of that is the indication of disease. Therefore what we take as food is of great importance. The food that we eat, according to *Ayurveda* is composed of *punchamahabhuthas* the five great element and thus the three qualities of *satva*, *rajas*, and *thamas*

According to *Upanishads*, the gross part of food becomes body and subtle part the mind. The food becomes the *dhatus*,*doshas*,and *malas* of the body.

The *dhatus* are seven in number. *Ahara rasa* (digestive juice), *raktha* (blood), *mamsa* (flesh), *medas* (fat), *asthi* (bones), *majja* (bone marrow) and *sukla* (semen).

During the initial process of digestion when the food begins to be digested, a sweet reactions sets in foamy *kapha* appears .later when the food is half digested, a second type of reaction which is sour set in .and digested food now process in to the intestine with a liquid substance called *pitta* appearing in it, when at last what is left of the food reaches the large

intestine it begins to dry up and is converted in to dry mass, during this process, a third type of reaction sets in which is bitter and astringent, *vata* appear at this time.

Vata pitta, *kapha* collectively known as the *thridoshas*. Each *dosha* predominates in a particular part of the body. *Kapha* in the chest ,*pitta* in the digestive organs and *vata* in the large intestine.

Kapha type asthma is the most common and most serious .wherein the system gets clogged with too much mucus . An excess of cold heavy mist foods and over- eating precipitates the condition. Attack may be present with dampish cough ,following asthmatic episodes. During a *pitta* type asthma attack excessive thirst and breathing become difficult. When a *vata* imbalance is dominant the throat is aggravated. There is dryness which shrunk the bronchial trachea and lead to poor air circulation. Therefore it is very clear that those in whom there is an equilibrium of the *doshas* remains healthy ,while those in whom any one of the *doshas* predominates are subject to disease.

In *Ayurveda* bronchial asthma is known as *Tomaka shvasa*. It is on the rise today with increasing levels of pollution and the stressful life style followed by people. Bronchial asthma is supposed to originate from afflictions of stomach and the gastro intestinal tract. That is why in the preliminary stage of the disease or just before its onset, the patient complains of indigestion constipation, or diarrhea. The attack of asthma may come without warning because of the hypersensitivity of the patient to certain substance like pollen, dust, emanations from certain animals like

dogs and casts, certain foods to which the person is allergic and of course, certain bacteria.

Bronchial asthma is characterised by difficulty in breathing, a sense of tightness, constriction around the chest, and wheezing noise as the breath is expelled. The small bronchial tubes which connect with the lungs are constricted due to swelling or accumulation of viscid phlegm in the main bronchi hence the difficulty in inspiration and expiration.

The attack of asthma comes on in the early morning when the patient suddenly wakes up with a feeling of apprehension and alarm. The attack may last for a few hours or a few days before it subsides.

Ayurveda maintains that there is a definite relationship between illness and the metaphysical state of an individual. Its approach to medical treatment is to focus on the person rather than the disease.

The human body is in a state of continuous flex or dynamic equilibrium. The *pancha bhutas* are represented in the human body as the *doshas*, *dhateus*, and *malas*. There are three *doshas* in the body they are *vata*, *pitta*, and *kapha* known as *tridoshas*. They hold the pride of place among the body constituent's.

Vata is a combination of two elements of the universe, namely, air, and ether. p*itta* is an amalgam of fire and earth. *Kapha* is the combination of earth and water.

According to *Ayurveda*, when any of the three *doshas* become excessively agitated or increases disproportionately in relation to the others,

an imbalance is created, and disease results. The restoration of health would depend on regaining the balance among the three *doshas*. The balance would in turn depend on the consumption of environmental matter in the right form, proportion, combination, and at the right time. When the physician become sure of the nature of the imbalance of the *doshas* he prescribes a substance, namely, a drug or a diet which will correct the equilibrium (Murthy and Pandey. 1995).

Concept of Sidha Medicine

Siddha system is one of the oldest systems of medicine in India . The term *Siddha* means devine achievements and *Siddhars* were saintly persons who achieved results in medicine. Eighteen Siddhars were said to have contributed towards the development of this medical system. *Siddha* literature is in Tamil and it is practiced largely in Tamil speaking part of India and abroad. The *Siddha* System is largely therapeutic in nature. This principles and doctrines of this system, both fundamental and applied, have a close similarity to *Ayurveda*, with specialization in Iatro-chemistry. According to this system the human body is the replica of the universe and so are the food and drugs irrespective of their origin.

Like *Ayurveda*, this system believes that all objects in the universe including human body are composed of five basic elements namely, earth, water, fire, air and sky. The food, which the human body takes and the drugs it uses are all, made of these five elements. The proportion of the elements present in the drugs vary and their preponderance or otherwise is responsible for certain actions and therapeutic results.

As in *Ayurveda*, This system also considers the human body as a conglomeration of three humours, seven basic tissues and the waste products of the body such as faeces, urine and sweat. The food is considered to be the basic building material of human body which gets processed into humours, body tissues and waste products. The equilibrium of humours is considered as health and its disturbance or imbalance leads to disease or sickness. This system also deals with the concept of salvation in life. The exponents of this system consider achievement of this state is possible by medicines and meditation.

The *Siddha* system is capable of treating all types of disease other than emergency cases. In general this system is effective in treating all types of skin problems particularly psoriasis, STDs, urinary tract infections, diseases of liver and gastro intestinal tract, general debility, postpartum anaemia, diarrhoea and general fevers in addition to arthritis and allergic disorders

Diagnosis and Treatment

The diagnosis of diseases involve identifying its causes. Identification of causative factors is through the examination of pulse, urine, eyes, study of voice, colour of body, tongue and the status of the digestive system. The system has worked out detailed procedure of urine examination which includes study of it's colour, smell, density, quantity and oil drop spreading pattern. It is holistic in approach and the diagnosis involves the study of person as a whole as well as his disease.

The *Siddha* system of medicine emphasizes that medical treatment is oriented not merely to disease but has to take into account the patient,

environment, the meteorological consideration, age, sex, race, habits, mental frame, habitat, diet, appetite, physical condition, physiological constitution etc. This means the treatment has to be individualistic, which ensures that mistakes in diagnosis or treatment are minimal. Prevention of disease and promotion of health are important aspects of *Sidha*. Correct food habits are stressed. The notion of asthma is described as the same as those in *Ayurveda* system of medicine.

Unani systems of medicine

Unani system of medicine originated in Greece. This system of medicine is based on the *humoural* theory which presupposes the presence of four homours namely – blood (*dam*), phlegm (*bagham*) yellow bile (*sufra*) and black bile (*sanda*) in the body. The temperament of persons are expressed accordingly by the words sanguine, phlegmatic, choleric and melancholic according to the preponderance of them in the body. Every body has got a unique humoural constitution which represents the healthy state of humoural balance of the body. The *Unani* medicine plays a vital role when the individual experience humoural imbalance .The correct diet and digestion can bring back the humoural balance. Its main emphasis on diagnosis of a disease through *nabz* (pulse, baul (urine), *barz* (stool), etc. It has laid down six essential pre-requisites for the prevention of diseases. They are essentially known as ‘babesittezarooriya’ are air, drinks, foods, bodily movements and response. Psychic movement and response, sleep and wakefullness, excretion and retention.

Diagnosis and treatment

The *Unani* system of diagnosis of disease, treatment and restoring health, revolve round the concept of temperament or *mizaj*. The humours have also specific temperament . Changes in temperament are related to changes in the balance of humous. Any changes in temperament brings about a change in the health of the individual. Thus imbalance of harmony of humours and temperament along with failure of one or more parts of the body to eliminate pathogenic waste causes disease.

Treatment is mainly done through drugs, which also have identified specific temperament (hot, cold, moist, dry, etc in different degrees). Drugs not only normalize the existing imbalance but also improves the natural defense mechanism of the body so as to prevent or minimize chances to future disease. Regulation of diet constitutes an important part of the treatment.

Concept of Homeopathy

Homoeopathy today is a rapidly growing system and is being practiced almost all over the world. In India it has become a household name due the safety of its pills and gentleness of its cure. A rough study indicates that about 10% of the Indian population solely depend on Homoeopathy for their health care needs.

It is more than a century and a half now that Homoeopathy is being practiced in India. It has blended so well into the roots and traditions of the country that it has been recognised as one of the National Systems of Medicine and plays an important role in providing health care to a large number of people. Its strength lies in its evident effectiveness as it takes a

holistic approach towards the sick individual through promotion of inner balance at mental, emotional, spiritual and physical levels.

The word ‘Homoeopathy’ is derived from two Greek words, *Homois* meaning similar and *pathos* meaning suffering. Homoeopathy simply means treating diseases with remedies, prescribed in minute doses, which are capable of producing symptoms similar to the disease when taken by healthy people. It is based on the natural law of healing- "*Similia Similibus Curantur*" which means "likes are cured by likes". Dr. Samuel Hahnemann (1755-1843) gave it a scientific basis in the early 19th century. It has been serving suffering humanity for over two centuries and has withstood the upheavals of time and has emerged as a time-tested therapy. The scientific principles propounded by Hahnemann are natural and well proven and continue to be followed with success (Jaggi, O.P., 1998).

According to Hahnemann, the founder of Homeopathy, a human body functions and is maintained by a vital force. This force is capable of bringing about an adjustment in the body and mind to the best advantage of a person when he is threatened by adverse influences.

Disease means disorderly functioning of this vital force. In acute disease, this vital force, though disordered to a great extent or even to the point of extinction, still retains the inherent capacity to set itself right with or without medicinal help. In chronic disease, however the vital force though altered in an insidious way gets so deranged that it seems to have lost that inherent capacity of self-adjustment.

Principles of homoeopathy

Homoeopathy is the system of treatment based on demonstrable laws and principles, which are -

a) The Law of Similars - It is also called the Law of Cure. This law demonstrates that the selected remedy is able to produce a range of symptoms in a healthy person similar to that observed in the patient, thus leading to the principle of *Similia Similibus Curentur i.e. let likes be treated by likes*. To give a simple example the effects of peeling an onion are very similar to the symptoms of acute cold. The remedy prepared from the red onion, *Allium cepa*, is used to treat the type of cold in which the symptoms resemble those we get from peeling onion. The principle has been verified by millions of Homoeopaths all over the world.

b) The Law of Single Remedy - This law directs to choose and administer such a single remedy, which is most similar to the symptom complex of the sick person at a time.

c) The Law of Minimum Dose - The similar remedy selected for a sick should be prescribed in minimum dose, so that when administered there is no toxic effects on the body. It just acts as a triggering and catalytic agent to stimulate and strengthen the existing defense mechanism of the body. It does not need to be repeated frequently.

Diagnosis and treatment in Homeopathy

Diagnosis in homeopathy differs from diagnosis in other system of medicine. Remedies prescribed for the patient are selected and guided by the symptoms that the patient has. Naturally a patient who is having

symptoms of bronchial asthma such as difficulty in breathing, a sense of tightness, constrictions around the chest and a wheezing noise as the breath is expelled is treated the symptom described accordingly by the patient.

Even among the symptoms, some symptoms receive the first consideration and priority while others, the least. Thus the mental and physical symptoms related to the patient as a whole, receive the first consideration. Next is the strange, rare and uncommon symptoms which are not due to physiological, anatomical, or pathological changes, but are unique and consequently expressive of the individuality of the patient. Then come the symptoms peculiar to the concerned parts, tissues or organs of the patient. Finally the symptoms which are common to all disease belonging to the same category and corresponding to the common symptoms observed in various drug proving, are considered.

Homeopathy has no specific remedy for any disease by name, but it offers a specific remedy for each individual case of disease.

As the patient's symptoms are said to represent a natural attempt of the body to restore health, and ought to be reinforced rather than interfere with, correct prescription is often characterised by a brief aggravation of existing symptoms at first before they are ameliorated.

A core principle that Hahneman developed within homeopathy was related to holism, which he called the totality of the symptoms (Jaggi. O.P., 1998). By this he meant that health problems faced by an individual were not based on merely one or two symptoms or diagnosis but the disturbances of the whole mind and body taking in the widest possible view of life – what

today homeopaths call the maximum totality. This taken in to account the attitude, in new thoughts, outer expression, diet and climate relationships, work and creativity, sleeping, dreams and fantasies, ambitions, will, determination, love, sex, spirituality emotions, current problems and problems from conception onwards, as well as the state and nature of the country where the patient lives in.

Concept of Orthopathy

Orthopahty is a scientific version of Naturopathy evolved in United States since the middle of 18th century. Nature Cure also known as Naturopathy, is a combination of a variety of natural therapeutics and methods of healing, passed down through the ages, this system leans upon the wisdom of the ancients as well as modern science (Jaggi, O.P. 1998).

Nature cure believes that disease is a part of Nature's effort to remove morbid matter, which attracts germs, from the body. Suppressing the symptoms of disease can result in chronic aliments. Nature cure aims at helping Nature to rid the body of waste matter lay using the curative properties of Nature's elements the sun, air, water, earth and ether, as natural curers. Gandhi our father of nation had practiced naturopathy and he had compiled this wisdom about a centaury ago (Gandhi, M.K. 1996). Based on elaborate scientific analysis the Orthopathic concepts are documented in 1852 by one of the founders of Orthopathy Edward Jennings (1960), which was reprinted by Health Research Foundation California

Orthopathy does not believe in germ theory, calorie theory about nutrients, and the pharmacological theories. The basic etiological concepts

are even orthogonal to the modern medical concepts. The meaning of Orthopathy is that the disease itself is the cure. The disease is the body's attempt to bring back to the balanced state from depleted bioenergy. Disease symptoms are just warning signals about the depletion of bioenergy. So a disease comes not to kill the organism but to save it from depletion of energy. Mostly the depletion is due to toxious elements entering the body which creates an imbalance in the combination of the protoplasm out of which the body is evolved. Since this imbalance is the cause of all diseases the treatment is the same for all disease symptoms. Only nutritional correction is the sure way to the restoration of health. The method of elimination of symptoms is through the stopage of the cause of disease, which is the stopage of the intake of toxins in the body. Toxins are those substances which are not assimilated by the body as its constituent. Usually such toxins of chemical nature are more harmful to the body. Toxins enter the body mostly through food, water and air. Elimination of toxins through dietary corrections fasting and proper rest leads to cure. Such cure alone is permanent cure.

The advocate of naturopathy pay particular attention to eating and living habits, adoption of purificactory measures, of hydrotherapy, cold packs, mud packs, baths, massages and variety of methods based on their innovative talent

A carefully supervised use of total fast or partial fast is advocated to clear the systems of toxic build up. Water and dilute juices are permitted. The naturopathy has to keep a strict supervision by an experienced hand.

The patient may develop physical and emotional untoward effects. The system believes that the way of lif if properly organized and if one does not retaliated one can get boundaries of energy, health and happiness from the benevolent nature what one is to do prevention of disease, promotion of health and to get therapeutic advantages is to adopt means natural to nature with no heroic measures of treatment or retaliation as distortion of nature. .Such care alone is permanent cure .Suppression of symptoms using drugs is never approved in naturopathy as it may result later in to more harm to the body.

Treatment such as allopathic, *ayurveda*, homeopathy *sidha*, *unani* etc. are similar in one way or other and the procedure is same as that of symptoms suppression. The suppression of symptoms is not cure as it will transform into another disease as chronic or terminal one.

Complimentary and alternative medicine

Complimentary and alternative medicine as defined by national Center for Complimentary and Alternative Medicine (NCCAM) is a group of diverse medical and health care systems, practice and products that are not presently considered to be part of conventional medicine – the allopathy. Though some scientific evidence exist regarding some complimentary and alternative medicine therapies for most there are questions that are yet to be answered through well designed scientific studies that is the questions such as whether they work for the disease or the medical conditions for which they are used . The major alternative systems are classified as :

1. Alternative medical systems

Alternative medical systems are built upon complete systems of theory and practice. Often these systems have evolved apart from and earlier than the conventional medical approach used in the United States. The alternative systems that have developed in western culture include homoeopathic medicine and naturopathic medicine and medical systems that have developed in non –western culture are Ayurveda and Chinese medicine

2. Mind body interventions

Mind body medicine uses a variety of techniques designed to enhance the mind, capacity to affect bodily function and symptoms. Some techniques that were considered complimentary and alternative medicine in the past have become main stream such as patient support groups and cognitive-behavioral therapy. Other mind body techniques are still considered are meditation, prayer, mental healing and therapies that use creative outlet such as art, music and dance.

3. Biologically based therapy

The biologically based therapies in complimentary and alternate system use substances found in nature, such as herbs, foods, and vitamins .Some example include dietary supplements, and herbal products.

4. **Manipulative and body based methods**

Manipulative and body based methods in CAM are based on manipulation and /or movement of one or more parts of the body. This include Chiropractic manipulation, and massage.

5. Energy therapies

Energy therapies involve the use of energy fields. They are of two types as bio field therapies and bio electromagnetic-based therapies. The biofield therapies are intended to affect energy fields that purportedly surround and penetrate the human body. The existences of such fields has not yet been scientifically proven. Some forms of energy therapies manipulate bio fields by applying pressure and / or manipulating the body by placing the hands in, or through, such fields include Qi gong, Reiki, and therapeutic touch.

Bio electromagnetic –based therapies involve the unconventional use of electromagnetic fields ,such as pulsed fields , magnetic fields, or alternating current or direct-current fields.

Acupuncture

Acupuncture (Ak-yoo-pungk-cher) is a method of healing developed in China probably 2,000 years ago. Today, acupuncture describes a family of procedures involving stimulation of anatomical points on the body by a variety of techniques. American practices of acupuncture incorporate medical traditions from China, Japan, Korea, and other countries. The acupuncture technique that has been most studied scientifically involves

penetrating the skin with thin, solid, metallic needles that are manipulated by the hands or by electrical stimulation.

In acupuncture method of therapy asthma is categorized in to three types, namely lung asthma, spleen asthma and kidney asthma. The causes of the three types of asthma vary: lung asthma is caused due to pollution or unhygienic conditions, spleen asthma due to faulty diet and kidney asthma due to hereditary factors. The diagnosis of asthma is done through a special diagnostic machine called ‘acujing’ which determine the lack of *chi* (vital energy) flow to lungs, spleen or kidney. Very fine hair-thin disposable needles are pieced into the specific points on the body corresponding to the type of asthma one is suffering from. A simple dietary restriction is also emphasized.

Chiropractic

Chiropractic (kie-roh-PRAC-tic) is a CAM alternative medical system. It focuses on the relationship between bodily structure (primarily that of the spine) and function, and how that relationship affects the preservation and restoration of health. Chiropractors use manipulative therapy as an integral treatment tool. It is a treatment and prevention of mechanical disorders of the musculoskeletonal system, with special emphasis on the spine, under the hypothesis that these disorders affect general health via the nervous system. Chiropractic treatment emphasis manual therapy including spinal manipulation and other joint and soft tissue manipulation, and includes exercises and health and life style counseling. Traditionally,it assumes that a

vertebral subluxation or spinal joint dysfunction can interfere with the body's function and its innate ability to heal itself.

D.D Palmer founded chiropractic in the 1880s and his son B.J.Palmer helped to expand it in the early 20th Centaury it has two main groups : 'straights,' now the minority, emphases vitalism, innate intelligence and spinal adjustments and consider subluxations to be the leading cause of all disease: 'mixers' are more open to mainstream and alternative medical techniques such as exercise, massage, nutritional supplements, and acupuncture. Chiropractic is well established in the U.S., Canada and Australia.

Electromagnetic fields

Electromagnetic fields (EMFs, also called electric and magnetic fields) are invisible lines of force that surround all electrical devices. The Earth also produces EMFs; electric fields are produced when there is thunderstorm activity, and magnetic fields are believed to be produced by electric currents flowing at the Earth's core.

Massage

Massage (muh-SAHJ) therapists manipulate muscle and connective tissue to enhance function of those tissues and promote relaxation and well-being.

Osteopathic

Osteopathic (ahs-tee-oh-PATH-ic) medicine is a form of conventional medicine that, in part, emphasizes diseases arising in the musculoskeletal system. There is an underlying belief that all of the body's systems work together, and disturbances in one system may affect function elsewhere in the body. Some osteopathic physicians practice osteopathic manipulation, a full-body system of hands-on techniques to alleviate pain, restore function, and promote health and well-being.

Qi gong

Qi gong (chee-GUNG) is a component of traditional Chinese Medicine that combines movement, meditation, and regulation of breathing to enhance the flow of qi (an ancient term given to what is believed to be vital energy) in the body, improve blood circulation, and enhance immune function.

Reiki

Reiki (RAY-kee) is a Japanese word representing Universal Life Energy. Reiki is based on the belief that when spiritual energy is channeled through a Reiki practitioner, the patient's spirit is healed, which in turn heals the physical body.

Therapeutic Touch

Therapeutic Touch is derived from an ancient technique called laying-on of hands. It is based on the premise that it is the healing force of the therapist that affects the patient's recovery; healing is promoted when the body's energies are in balance; and, by passing their hands over the patient, healers can identify energy imbalances.

Traditional Chinese medicine

Traditional Chinese medicine (TCM) is the current name for an ancient system of health care from China. TCM is based on a concept of balanced *qi* (pronounced ‘chee’), or vital energy, that is believed to flow throughout the body. *Qi* is proposed to regulate a person's spiritual, emotional, mental, and physical balance and to be influenced by the opposing forces of *yin* (negative energy) and *yang* (positive energy). Disease is proposed to result from the flow of *qi* being disrupted and *yin* and *yang* becoming imbalanced. Among the components of TCM are herbal and nutritional therapy, restorative physical exercises, meditation, acupuncture, and remedial massage.

Buteyko method

The Buteyko method or Buteyko Breathing Technique is a holistic health philosophy, primarily for the treatment of asthma, that includes a set of breathing exercises developed by the Russian doctor Konstantin Pavlovich Buteyko. The method is taught as a complementary therapy and several small clinical trials have shown that it can safely reduce asthma

symptoms and the need for reliever medication in some people, as well as increasing quality of life scores. However, improvement takes time and commitment, requiring daily exercises over a period of weeks or months.

At the core of the Buteyko method is a series of breathing exercises that focus on nasal-breathing, breath-holding and relaxation. At present it is used to treat asthma, sleep apnea, snoring, anxiety attacks and panic attacks. These conditions are associated with disrupted or irregular breathing patterns and the Buteyko exercises aim to 'retrain' breathing to restore a natural pattern, akin to certain forms of *Yoga*.

Fish medicine

Fish medicine is a kind of alternative medicine system in India propagated by the Goud family in Hyderabad. They administer fish medicine once every year on an auspicious day primarily in the month of June. This treatment has gained immense popularity over the years. The treatment procedure is that, at first the medicine which are prepared by them, a yellowish-looking paste, is kept in the mouth of a living sardine fish, two to three inches in size, and slipped effortlessly into the mouth of the patient. The live fish travels, fluttering its tail and fins through the throat and negotiate the congestion. Three doses of extra medicine are given to the patients, to be taken after every fifteen days. Strict diet control should be followed for forty five days. The medicine has been found quite effective, if taken for three consecutive years.

Asthma : Approach of Modern Medicine (Allopathy)

Asthma is a disease that affects a person's ability to breathe. It is a chronic lung disease characterized by airway obstruction that is reversible (but not always completely so), airway inflammation, which results from edema or swelling in the lining of the bronchial tubes, and increased airway responsiveness to a variety of stimuli. The symptoms of an asthma attack include wheezing, shortness of breath and coughing. Breathing out is particularly difficult during an asthmatic attack and wheezing during expiration is particularly characteristic. Asthma may be periodic with relatively symptom free intervals or it may be relatively chronic with mild to moderate symptoms present most of the time. Either type of patient may have a severe acute life-threatening attack, which may require potent drugs in a hospital setting (Schachter, M.B.2005).

Asthma attacks may be triggered by a variety of stimuli, the nature of which varies from individual to individual. Upper respiratory infections, either viral or bacterial, often trigger an asthmatic attack. Exposures to tobacco smoke, perfumes, paints or other strong chemical odors are often culprits. Changes in weather or temperature, exposure to molds, animal danders, grass or tree pollens are all triggers for some asthmatic patients. For some patients, exposure to sulfites, used to preserve foods, has resulted in deaths due to asthma. Certain food colorings, such as the yellow dye tartrazine, as well as many other food additives may be triggers. Drugs, such as aspirin, non-steroidal anti-inflammatory drugs-like Advil, beta blockers-like Inderal and many others can precipitate an asthma attack.

Diagnosis of Asthma

Schachter, M.B. (2005) in a review article presents the modern medical(allopathic) approaches of diagnosis and treatment of asthma. According to him, aside from the clinical observations of shortness of breath, coughing and wheezing, asthma can be diagnosed by hearing the wheeze with a stethoscope. One can use two medical instruments to help with the diagnosis and response to treatment. The first is called a Spiro meter. Spiro metry involves the patient taking a deep breath and blowing into the tube of the Spiro meter as hard and as fast as he can. The patient may also breathe in and out several times into the tube for additional information. The spiro meter measures the amount of air expired and how much is expired at different phases of the expiration. With asthma, we'll see a reduced total amount of air expired or forced vital capacity. We'll also see a reduced volume expired during the first half, second and second or forced expiratory volume 0.5 and 1.0. Finally, we'll observe a reduced volume during the middle cycle of the expiration. Each one of these measurements can be improved after the person breathes a bronchodilator drug, thus showing that these changes are at least partially reversible. This reversibility leads one to the diagnosis of asthma rather than a more fixed irreversible lung disease. Another instrument useful in monitoring the severity and response to treatment in asthma patients is a peak flowmeter. Again, the person expires a deep breath as quickly and completely as possible and the peak flow is measured. This instrument is important for monitoring treatment response.

Mechanisms of an asthma attack

During an asthma attack, first we see bronchial spasm and/or constriction of the smooth muscles of the bronchi or airway tubes, leading to a narrowing of these passages. Second, we get inflammation and edema or swelling of the inner lining of the bronchi, which further narrows the airways. Third, we observe increased mucus production with the development of mucus plugs that may further block air from getting to the little air sacs in the lungs, thus preventing oxygen from getting into the bloodstream and carbon dioxide from leaving the bloodstream in order to leave the body. And, finally, we frequently see evidence of allergic phenomena on a cellular level, with allergy cells called eosinophils, resulting in further inflammation of the airways. This allergic mechanism almost always involves the substances known as platelet activating factor or PAF and histamine, to a lesser extent. In addition to causing inflammation, this allergic reaction also contributes to bronchial hyper responsiveness.

To review, the important mechanisms of asthma are: 1) an increased responsiveness of the airways to a variety of stimuli; 2) a narrowing of those airways due to a contraction of the smooth muscles of the bronchi; 3) a further narrowing due to inflammatory changes in the walls of the bronchi; and 4) an increased production of mucous and fluids in the airways causing further narrowing and even blockage.

Conventional allopathic treatment approaches to asthma

Schachter, M.B. (2005) summarises the conventional allopathic treatment of asthma. A good conventional approach to asthma will look at the environmental stimuli that set off a response from the super sensitive

airways. Here, a careful medical and ecologic history is most important to establish which stimuli are most important for this particular patient. Do asthma attacks occur mostly indoors or outdoors? If indoors, are they worse at home or at work? Are they worse during a particular season? Tree pollens, for example, are very high in early spring, grass pollens peak in the late spring and the classic ragweed season begins in late summer and ends with freezing weather. Sometimes asthma attacks are precipitated by exercise. Patients will be warned about the adverse effects of active or passive tobacco smoke. They may also be advised to avoid dust or fumes of chemicals, exposures to people who have upper respiratory infections, cold air, known inhalant allergens such as cats or dogs, grasses or pollens and various drugs such as the beta blockers, ace inhibitors, aspirin and certain non-steroidal anti-inflammatory drugs. Once allergens have been identified, measures recommended to minimize exposure to them might include avoiding outdoor activities in early morning when allergen levels are highest, keeping windows closed as much as possible during the peaks of allergy seasons and keeping indoor humidity levels between 40 and 50 percent to reduce pollen and mold exposure. Eliminating carpeting and upholstery when possible and using plastic pillow and mattress casings will help to keep dust exposure to a minimum. Laundering bedclothes weekly in hot water is also recommended. High efficiency particulate air, abbreviated HEPA filtering devices, effectively reduce airborne allergens and other inhaled irritants.

Occupational exposure must be explored as more than 200 different occupational asthma triggers have been reported in the medical literature.

The concept of total body burden of toxic and allergy factors is very important here. To prevent and treat asthma attacks, the goal is to reduce exposure to toxic and allergenic substances as much as possible to lower the total body burden.

Use of bronchodilator drugs by conventional allopathic physicians to manage asthma

Frequently, an asthma attack may be precipitated by a bacterial infection. In such a case, an antibiotic medication is helpful in clearing up the infection. During severe attacks, respiration may be limited so much that the oxygen concentration in the bloodstream may be dangerously low. Breathing in oxygen will help to correct this situation. Aside from oxygen and antibiotics, the medications to treat both acute and chronic asthma are classified into two categories, bronchodilators and anti-inflammatory agents. Together, these medications are used to reverse or prevent air flow obstruction. The smooth muscles of the airways contain receptors that are known as beta 2-adrenergic receptors. Upon stimulation, these receptors cause a relaxation of the smooth muscles of the bronchi. (Schachter, M.B., 2005).

A hormone in our body that stimulates this type of receptor is adrenaline or epinephrine, which is the fight or flight hormone secreted by the adrenal medulla. The drugs used to stimulate these receptors are called beta 2- adrenergic agonists. One of the most used of these drugs is albuterol whose brand names are proventil or ventolin. They are administered mostly by metered dose inhalers (abbreviated MDI). For severe attacks, albuterol

may be administered in the hospital by nebulizer every one or two hours. However, the frequency is reduced as soon as possible, and the patient is switched to the metered dose inhaler. Outside of the hospital the medication is used as necessary, preferably only one or two puffs daily. It may be used prior to exercise to prevent an exercise induced asthmatic attack.

Although the product literature states that up to 12 puffs a day may be used, patients with mild asthma should need these drugs only 3 or 4 time a week. A pattern of regular or increasing use approaching 8 to 12 puffs a day reflects poor asthma control and warrants immediate re-evaluation. Although these beta 2-adrenergic agonists are reported to be reasonably safe, they do stimulate the autonomic nervous system and may produce rapid or irregular heartbeat, insomnia, shakiness and nervousness.

Anti-cholinergic agents constitute the second class of bronchodilators. Whereas the beta 2-adrenergic agonists mimic the sympathetic nervous system, the anti-cholinergic agents work by inhibiting the parasympathetic nervous system as the latter tends to constrict the bronchi. So by inhibiting the action of the parasympathetic nervous system with anti-cholinergic drugs like ipratropium bromide or atrovent, bronchodilation is promoted. Atrovent is also given by inhaler. Potential adverse effects include dry mouth, cough, headaches, a worsening of glaucoma and urinary retention.

A third class of bronchodilators are the methylxanthines, such as aminophylline and theophylline. Caffeine is another example of a methyl xanthine, although it is not used in asthma. The exact mechanisms of action of the methylxanthines in causing bronchodilation is unclear. Previously,

these drugs had been considered the first line of therapy for asthma, but because of their serious side effects, they are somewhat less important at the present time. However, aminophylline or theophylline may be used intravenously if other treatments have not got an attack under control.

For chronic asthma, theophylline, whose brand names include theo-dur, uniphyl, slo-bid and others, is now considered a third-line choice, but may be of benefit in nighttime asthma, due to its long duration of action. Adverse effects of theophylline involve many organ systems. They may be mild or severe and life threatening. Gastrointestinal symptoms include heartburn, nausea and vomiting. Central nervous system negative side effects include headaches, insomnia, tremor and seizures. And finally abnormal heart rhythms and deaths have been reported.

Some studies have shown that frequent overuse of the bronchodilators may result in an overall worsening of the asthma condition. This effect and the adverse effects on the cardiovascular system may explain in part the increasing death rate from asthma during the past several years. In other words, increasing mortality from asthma may be partially iatrogenic, or in other words, doctor caused.

Anti-Inflammatory drug

Control of inflammation is currently the primary focus in managing asthma. The most effective agents for this purpose are the corticosteroids. These medications interfere with the synthesis of inflammatory mediators and prevent migration and activation of inflammatory cells. Also, they improve responsiveness of airway beta receptors, which promotes relaxation

of bronchial smooth muscle. Corticosteroids, produced naturally by the adrenal cortex, include hydrocortisone or cortisol, which can be prescribed by physicians.

However, conventional physicians usually prefer to use one of the synthetic corticosteroids. During an acute severe asthmatic attack requiring hospitalization, the patient is usually given methylprednisolone (brand name solu-medrol) as a 60 to 80 mg intravenous push every six to eight hours for the first 36 to 48 hours of hospitalization. The patient is then switched to high doses of oral prednisone or methyl prednisolone, which is rapidly tapered over the next 10 days to two weeks. Short-term adverse effects from oral or intravenous steroids include increased appetite, weight gain, elevated blood sugar, fluid retention, mood changes, and gastrointestinal upset. Most patients can avoid long-term (months or years) use of corticosteroids, which have additional adverse effects and risks. These include a suppressed immune system, adrenal suppression, osteoporosis, muscle weakness, cataracts, skin changes, and peptic ulcers.

The administration of corticosteroids by inhalation is being acclaimed by many clinicians as the greatest advance in asthma management in the last 20 years. Inhalation corticosteroids are being recommended by many physicians as the first-line maintenance therapy for the adult with daily or frequent asthma symptoms. However, inhaled steroids appear to be underutilized, as they constituted less than 15% of all asthma prescriptions in 1993, according to a pharmaceutical industry survey. Their dosage varies from 1 to 5 puffs, two to four times a day, depending on the preparation.

Local adverse effects include hoarseness, cough, and oral candidiasis or thrush. Generally, chronic adverse side effects of steroids given orally are not seen to any extent with the inhaled form of steroids. The inhaled steroids should be given at the lowest possible dose, capable of controlling the asthma. Examples of inhaled steroid products are: beclovent, vanceril, azmacort, and aerobid.

A non-steroidal anti-inflammatory inhaler that can be used for asthma is cromolyn sodium or intal. It prevents mediator release from airway mast cells and inhibits both early- and late-phase immune response in asthma, but it is not as effective as the corticosteroids. The most common side effect is coughing.

Psychological treatment of asthma

Psychological treatment of asthma covers various psychotherapeutic procedures such as psycho-educational self management programs, relaxation therapy, bio feed back, family therapy, behavior therapy group dynamics and yogasana.

Psycho educational approaches

Psycho educational approaches provides improved adjustment, increased medication compliance, greater perceived self competence in managing symptoms and decreased use of medical services. It also facilitate the achievement of improved quality of life for individual with asthma through education, service and support .

Relaxation training

Many tense or agitated individuals with psychosomatic complaints derive immense benefit from relaxation training. Although it is not clear whether the effectiveness depends on whole body relaxation or specifically facial or respiratory muscle relaxation (Lehrer, Sargunaraj and Hochroan, 1993). During relaxation, respiration usually becomes slower, pulse rate and blood pressure decrease and a noticeable calming effect ensures.

Hypnosis

An artificially induced dream state that leaves the person open to suggestion, hypnosis is a legitimate technique to help people manage various conditions. Hypnosis might give people with asthma or allergies more self-discipline to follow good health practices

Family therapy

Family therapy is also helpful as far as asthma patients are concerned because the family and the environment where the patient dwells, sometimes induces asthma. So a therapy for the family member also help the patient to overcome the recurrence of asthma attack. Behaviour therapy denotes the use of experimentally established principles of learning for the purpose of changing unadaptive behaviour. The therapy helps the patient to modify their behaviour and behaviour pattern. (Arnold, A. Lazarus, 1971).

Biofeedback

Biofeedback training is a technique in which the subject learns to monitor and gain control over automatic reflex body functions, by using information obtained from various types of machines. The body functions are translated into auditory and visual signals through electrodes attached to the subject. Biofeedback mostly used for learning to relax in conditions of disease cause by stress including asthma (Jaggi, O.P., 1998).

In biofeedback training, machines monitor and mirror the performance of certain bodily functions. The heart rate, body, hand or finger temperature, muscle tension, skin conductivity and brain waves can all be translated into auditory or visual signals via electrodes attached to the subject. The advantage of biofeedback in its promotion of self-responsibility people can take the skills into daily life, learning to monitor their physiological changes.

Biofeedback devices do not induce relaxation by themselves but can be used to learn the knack. One is encouraged to become receptive to message pertaining to tension or relaxation, or warmth or cold has given out one's body usually by imagining a warm and relaxing situation.

Group dynamics

Group dynamics means any and all of the collective interactions that take place with group. As the term dynamic implies the, forces that interact to influence individual are fluid and changing not static. Despite the changing nature groups, counselor need to focus on four main areas of group dynamic in order to understand and work effectively with the group. They are (1) The communication and interaction for occurring in groups (2) the attraction of

groups for their members. (3) The social controls that are excreted in groups and (4) the culture that develops in groups.

Communication patterns include both verbal and nonverbal communication among group members. They can intervene at appropriate times in order to facilitate the kind of helpful communication that moves the group toward the achievement of its goals.

Cohesiveness or the group's attraction for its members is a prime mode of help in the therapy experience. Highly cohesive groups have an overall higher outcome, higher levels of self disclose, and more group support and acceptance.

Social control concerns the methods by which the group gains sufficient compliance and conformity form its members to enable it to function in an orderly manner.

Group culture develop form the beliefs, customs and values shared by the group members and also from the environment in which the group functions. Group culture influences the objectives of the group, the task the groups decides to work on, the way members interact and the methods the group uses to conduct its business. Because it is the group itself as a therapeutic social system, that provides support, universality, advice, testing, learning interpersonal feedback, opportunities for altruism, and hope, it in reality the group that is the agent of change (Yalom 1975).

Yogasana

Yoga is derived from 'TANTRA 'an ancient time-tested science describing different system for increasing the speed of human evolution.

The Sanskrit word '*tan*' means expansion of consciousness and '*tra*' means 'liberations of energy'. 'The merge of *tantra* with the philosophy of V*edanta* formed the system of *yoga* (Saraswathi. S.S., 1983) The tantric philosophy and belief is to let the mind be, what it is and where it is, not to interfere. There is no need to fight with the mind, follow it and know it well.

Around 600 B.C the famous sage Patanjali systematised *asanas* and other procedures (breathing exercise, discipline, diet, meditation etc) linking them with *Smakhya* philosophy and compiled the entire concept into the *yoga sutras*, a text book of yoga techniques and ancient wisdom. (Jaggi, O.P 1998)

According to Patanjali *yoga* consists of eight components. *Yama*, *niyama*, *asana, pranayama*, *pratyalara*, *dharana*, *dhyana* and *samadhi*.

The first four components relate more to the body *yama* and *niyamas* are the dos and donts which are universally applicable and useful. The *asanas* (posters) tone up the body *Paranayama* comprises breathing procedures. *Yama*, *Niyama* and *Pranayama* constitute *hatha yoga* and prepare the body for the next four components which relate more to the mind. Patanjali alloted *hatha* yoga practices only a subsidiary place. For him these were only a means to an end. But in recent times, *hathayoga* practices, have attracted worldwide attention. They are used for maintaining physical fitness and getting rid of all kinds of disease including bronchial asthma

Yoga is union the integration of body mind and psyche through humoural and hormonal balance, elimination of toxic substance from the

body, increased blood circulation and alerted immune function through proper dispersion of *'prana'* all over the body. (Baby J., 2004).

Psychoneuroimmunology

Psychoneuroimmunology (PNI) is the study of the interaction between psychological processes and the nervous and immune systems of the human body. PNI takes an interdisciplinary approach, incorporating psychology, neuroscience, immunology, physiology, pharmacology, molecular biology, psychiatry, behavioral medicine, infectious diseases, endocrinology, and rheumatology.

The main interests of PNI are the interactions between the nervous and immune systems and the relationships between mental processes and the physiological functioning of the neuroimmune system in health and disease. PNI may also be referred to as psychoendoneuroimmunology (PENI).

In 1981 David Felten, discovered a network of nerves leading to blood vessels as well as cells of the immune system. The researchers also found nerves in the thymus and spleen terminating near clusters of lymphocytes, macrophages and mast cells, all of which help control immune function. This discovery provided one of the first indications of how neuro-immune interaction occurs.

According to Ader, Cohen and Felton (1981,2006) the underlying premise that the brain and immune system represent a single, integrated system of defense.

In 1985, a research by neuropharmacologist Candace Pert revealed that neuropeptide- specific receptors are present on the cell walls of both the brain and the immune system. The discovery by Pert *et al*. that neuropeptides and neurotransmitters act directly upon the immune system shows their close association with emotions and suggests mechanisms through which emotions and immunology are deeply interdependent. Showing that the immune and endocrine systems are modulated not only by the brain but also by the central nervous system itself has had an enormous impact on how we understand emotions, as well as disease.

The mechanisms underlying behaviorally induced alterations of immune function, and immune alterations inducing behavioral changes, is likely to have clinical and therapeutic implications that will not be fully appreciated until more is known about the extent of these interrelationships in normal and pathophysiological states.

The immune system and the brain talk to each other through signaling pathways. The brain and the immune system are the two major adaptive systems of the body. During an immune response the brain and the immune system 'talk to each other' and this process is essential for maintaining homeostasis. Two major pathway systems are involved in this cross-talk: the Hypothalamic-pituitary-adrenal axis (HPA axis) and the sympathetic nervous system (SNS). The activation of SNS during an immune response might be aimed to localize the inflammatory response.

The body's primary stress management system is the HPA axis. The HPA axis responds to physical and mental challenge to maintain

homeostasis in part by controlling the body's cortisol level. Deregulation of the HPA axis is implicated in numerous stress-related diseases. HPA axis activity and cytokines are intrinsically intertwined: inflammatory cytokines stimulate adrenocorticotropic hormone (ACTH) and cortisol secretion, while, in turn, glucocorticoids suppress the synthesis of pro inflammatory cytokines.

Psychoneuroimmunological effects

There are sufficient data to conclude that immune modulation by psychosocial stressors and interventions can lead to actual health changes. Although changes related to infectious disease and wound healing have provided the strongest evidence to date, the clinical importance of immunological deregulation is highlighted by increased risks across diverse conditions and diseases.

Stressors can produce profound health consequences. Theorists propose that stressful events trigger cognitive and affective responses which, in turn, induce sympathetic nervous system and endocrine changes, and these ultimately impair immune function.

Stress is thought to affect immune function through emotional and behavioral manifestations such as anxiety, fear, tension, anger and sadness and physiological changes such as heart rate, blood pressure, and sweating. Researchers have suggested that these changes are beneficial if they are of limited duration, but when stress is chronic, the system is unable to maintain equilibrium or homeostasis

According to Seligman (1991), a chain of events that is negative to an individual lead pessimistic style of functioning lead to illness. An unfortunate experience such as serious loss, defeat or failure, the person with a pessimistic explanatory style becomes depressed. The depression leads to depletion of neurotransmitter substance called catecholamine and the body increases the secretion of endorphins the body's own naturally produced form of morphine. When receptors in the immune system detect the increased presence of endorphins the immune system begins to turn itself down, any disease agents that are encountered while the immune system is weakened have much greater likelihood of overwhelming the remaining defense of the immune system.

Psychodynamics of asthma

Psychodynamics is a psychological analogy of the transient functions of the mind, drawn from the practice of neurology, and the principles of thermodynamics. In more detail, psychodynamics is the study of human behavior from the point of view of motivation and drives, depending largely on the functional significance of emotion, and based on the assumption that an individual's total personality and reactions at any given time are the product of the interaction between their conscious/unconscious mind, genetic constitution and their environment In medical practice, psychodynamics is defined as the systematized study and theory of the psychological forces that underlie human behavior, emphasizing the interplay between unconscious and conscious motivation and the functional significance of emotion. The mental forces involved in psychodynamics are

often divided into two parts: (a) interaction of emotional forces: the interaction of the emotional and motivational forces that affect behavior and mental states, especially on a subconscious level; (b) inner forces affecting behavior: the study of the emotional and motivational forces that affect behavior and states of mind;.

The original concept of ‘psychodynamics’ was developed by Sigmund Freud who, in the late 1870s, began to apply the principles of thermodynamics, predominantly those of Hermann von Helmholtz, to psychology (Bowlby, John, 1999). Freud suggested that psychological processes are flows of psychological energy in a complex brain, establishing 'psychodynamics' on the basis of psychological energy, which he referred to as libido.

The mental forces involved in psychodynamics are often divided into two parts: (a) interaction of emotional forces: the interaction of the emotional and motivational forces that affect behavior and mental states, especially on a subconscious level; (b) inner forces affecting behavior: the study of the emotional and motivational forces that affect behavior and states of mind.

A dynamic psychology is one that studies the transformations and exchanges of energy within the personality. This was Freud’s greatest achievement, and one of the greatest achievements in modern science, It is certainly a crucial event in the history of psychology.

The present study attempts to understand the psychodynamics of asthma in companions to normal population and population of another category. A personality test scores will be used for this purpose.

The principles and philosophy of psychonutritional cure

Ancient systems of Medicine all over the world share the view of health and eteology based on nutrition. Nutrition does not confine to food alone but the *panchabhootha* elements. The trihumour theory (*thridosha*) and the tetrahumour (*chathurdosha*) theory can be spoken in the terminology of modern science. Out of the 108 or more elements identified, only 24 or 26 constitute the human body as protoplasm. When the proportion of the protoplasm is proper we experience health or constant happiess (*niranthara ananda*) according to Ayurveda. The philosophy of such natural cure is summarised in an article entitled 'Correct nutrients cure disease' (Baby J., 2004).

When the constituent elements of the body are in disequilibrium we experience illhealth. This imbalance occurs when nonfood substances enter our body through air, food, water, radiation, etc. The unassimilated nonfood substances harmful to body are called toxins or *dusht*. The body will always try to eliminate such substances through our excretory organs. The process of such eliminations are called disease symptoms. So the disease is not viewed in psychonutritional cure as something harmful but it is viewed as the boy's attempt to save the body from harmful toxious substances.

There are thousands of such disease symptoms due to toxicity such as vomiting, diarrhea, ulcers, fevers, bleeding, pussing, headache, anxiety, temper and even psychosis, are all due to one reason that is toxemia. Sometimes the toxin may be deposited in the form of a tumour. More harmful toxins are those with chemical characteristics. All unassimilated

things are not toxins like the roughages in vegetables and fruits are not assimilated by the body which are not harmful on the other hand they are useful for the peristalsis in digestion.

Nutritional deficiency also is a cause of disease. Some deficiencies can be overcome by the body itself through synthesis.

The living bodies evolved or created out of the physical elements (*panchabhoothas*) are to be in constant interaction with its constituent elements in order to sustain life. Once it keeps away from *panchabhoothas* due to modern artificial living it becomes ill, we need oxygen through our breath, unboiled water and unboiled food. The living body should be immersed in unpolluted air. The skin need constant interaction with air, water, earth, etc. The living organism being a part of the universe takes nutrition from the basic elements *panchabhuthas* from the universe. This aspect is often ignored in the modern medical practice. Germs are not the cause of disease. Great microbiologist who were more eminent than the germ theorists had questioned the germ theory even at the time of its emergence. But their arguments were against the lucrative medical business and so they were not made known. The germs can not attack a pure healthy body. When *prana* or bioenergy get depleted the germs over-power and the disease symptoms are manifested. Germs themselves are not the primary cause of disease, they are only the after effect of the bioenergy. We can not germicide our body completely. There are many germs essential to our body, such as those essential in the digestic process. Modern sciences like anatomy, physiology, morphology, biochemistry, etc.

provide us with hundreds of evidences that man is a vegetarian animal. Precisely a frugivorous animal - eating, riped and fallen fruits and nuts and a few vegetables - edible for human beings. A famous biologist Harriward Carrigton (1964) gives hundreds of scientific arguments and evidences to prove these facts. The major evidences are given below.

The average length of the digestive canal (from mouth to anus) of an ordinary medium size cow is about 32 feet. A tiger longer than a cow has a digestive canal of 12 feet length only. What about human beings? If we are carnivorous, our digestive canal should have been12 feet or less. But the human digestive canal is between 24 and 30 feet length. The carnivorous animals eat flesh and bones along with skin, hairs and blood of prey animals. Man cannot eat raw flesh. The digestive enzymes of carnivorous animals are drastically different from that of vegetarian animals. Human digestive enzymes are similar to that of the vegetarian animals.

The human blood is about 80 percent alkaline and 20 percent acidic, which is very similar to that of vegetarian animals. The lower jaws of vegetarian animals are movable towards left and right. e.g, cow, horse, elephant and man while the carnivorous animals just bite and swallow the flesh, bone, skin, etc. without chewing. They have very strong, digestive enzymes, mostly of acidic contents.

Vegetarian animals drink water by sipping, while the carnivorous animals drink by licking. Vegetarian animals are active during day time and they sleep during night while the carnivorous animals are active during night and sleep during day time. The sweat glands or the sebaceous glands are

present only in vegetarian animals. The vegetarian animals at the time of their birth open their eyes while for the carnivorous animals the eyes open after several days. Their retinal chemistry is drastically different from that of the vegetarian animals.

Summary of principles and assumptions of psychonutritional cure

The following are the basic principles and assumptions of psychonutritional cure which are derived from authentic books on Orthopathy and from experiential insights and empirical proof from psychonutritional camps held as a pilot study for this research. These principles are depicted as the content of a Health Awareness Inventory (Ashraf C. and Baby J., 2009).

(a) Fundamental principles of health

(1) The body cells (protoplasm) are made out of the elements in the universe. The proportion of the combination of these elements is the basis of health.

(2) Health is that happiness experienced when the proportion of the body elements are exact.

(3) Genetic defects can be a cause for the disequilibrium of body elements.

(4) Life (health) sustains only through receiving nutrients constantly from external materials (air, earth, water, sunlight and ether).

(5) The vital energy will be most powerful when the body cells are pure.

(6) Some people even if they eat wrong food remain healthy due to their inborn vital power.

(7) A person lives or dies depending on her / his vital power.

(b) Fundamental causes of disease

(1) Often diseases happens when harmful nonnutrient materials enter the body.

(2) A major cause of disease is the disequilibrium of the body materials.

(3) Hostility, hatred, pride, selfishness all these would cause disease.

(4) Germs are not a primary cause of disease but an effect of depletion of bioenergy.

(5) Germs cannot attack a pure body.

(6) Disease symptoms indicate the presence of vital power in the body. A body that cannot bring symptoms has less vital energy and is in danger.

(7) All materials that are not assimilated by the body are not harmful, that having chemical characteristics are more harmful.

(8) Disease is not the cause of death, loss of bioenergy is the cause of death.

(c) What are disease symptoms?

(1) Disease symptoms are the excretions of harmful toxious substances through skin and the nine outlets of excretory organs, or storing them in the form of a tumour.

(2) All disease symptoms are the wise attempts of the body to save the body.

(3) Triggering a disease symptom and its removal are the activities of the body itself.

(4) A healthy body manifests symptoms. When the cause is removed the symptom will automatically disappear.

(5) Fever, diarrhea, skin disease, ulcer, etc. are all purification processes of the body.

(6) Fear is a prominent symptom. A toxious body will be affected by fear.

(d) The precise nature of drugs

(1) Though the drugs suppress symptoms temporarily, later the symptoms will reappear with more severity.

(2) Nonnutritive drugs works as a stimulant in the body, not as an assimilant.

(3) The life span of those who take more strong drugs, will get reduced.

(4) The belief that drugs cure disease is a very prominent superstition in the world.

(5) Nutritional correction alone is enough for a cure and no need for any drug application (except on emergencies).

(6) Application of drugs can be acceptable only on certain emergencies like snake bite and accident injuries.

(7) Most diseases occur due to the application of drugs.

(8) Harmful drugs are there in systems like Ayurveda, Siddha, Unani and Homoeo systems of Medicine other than Allopathy.

(9) Only when the nutritional correction fails to cure a disease, then only drugs or surgery should be done.

(e) The exact nature of cure

(1) Cure takes place automatically when the cause of disease is removed.

(2) Physical conditions like clean air, water, food and proper rest are sufficient for a cure.

(3) Bodily purity is the main requirement for the equilibrium of the mind (health).

(4) Cure is an automatic process of the body and nutrition is the most influencing factor in this process.

(f) Fundamental principles of food

(1) Edible fruits, nuts, vegetables, sprouted grains cereals and vegetables are the most suitable food for human digestive system.

(2) Second to raw food, the next suitable food is spiceless and saltless cooked food.

(3) The preserved and processes food sold in tins, packets and bottles are more harmful as they contain chemical preservatives.

(4) Food alone is not our nutrients, air, water, atmospheric temperature, pressure, gravitational force all such physical conditions are also nutrients.

(5) The calory theory on nutrition is incomplete and inadequate.

(6) All the nutritive aspects about raw food are not known to science.

(7) White sugar, processed grains (mida) hydrogenated oils and such incomplete items and salt are highly harmful.

(8) Animal food may cause fatal diseases in most people.

(9) The personality preferred natural food is the most suitable food.

(10) Our natural taste preference is destroyed by spicy food, which can be brought back by natural food alone.

Relevance of the present study

A close examination of the theory and practice of asthma and its remedial procedures it is clear that a complete remedy is not found in any of the systems. Based on the nonformal interviews with asthma patients and therapists in various institutions the investigator is fully convinced about it. (The investigator himself is an asthma patient with occasional severe attacks

and hospitalisation and has taken part in the therapy intervention but data not included). The eteology, psychology and physiology of asthma is vague and inconclusive. The need of a well controlled study of asthma incorporating the relevant physiological and psychological variables was felt. The study attempts to make an efficient therapy package for cure of asthma and to evaluate the eteology, therapy and prognosis of asthma prevailing in various systems of medicine.

CHAPTER II

REVIEW OF LITERATURE

REVIEW OF LITERATURE

Asthma is a chronic respiratory disease of unclear etiology, characterized by reversible airway obstruction and heightened airway irritability usually accompanied by inflammation of tissues of the airways, mucus congestion, or constriction of airway smooth muscles (Busse & Reed, 1988) Asthma flares are commonly triggered by allergens, airway irritants exercise, cold air, and viral infection (National Heart, Lung and Blood Institute (NHLBI) 1997)

Nagendra & Nagarathna (1998) defined bronchial asthma as a condition characterised by recurrent attacks of difficulty in exaltation due to wide-spread reversible narrowing of airways in the lungs, which varies in severity over a short period of time either spontaneously or as a result of treatment. Remarkable hyperactivity of the air passages and excessive response by narrowing to various kinds of stimuli such as immunological, infective, psychic, physical and chemical agents.

Asthma can be affected by stress, anxiety, sadness, and suggestion, as well as by environmental irritants or allergens, exercise and infection. It is also is associated with an elevated prevalence of anxiety and depressive disorders. Asthma and these psychological status and traits may mutually potentiate each other through direct psychophysiological mediation, non adherence to medical regimen, exposure to asthma triggers, and inaccuracy of asthma symptom perception. Asthma education programmes that teach about the nature of disease, medications, and trigger avoidance tend to

reduce asthma morbidity. Other promising psychological interventions as adjuncts to medical treatment include training in symptom perception, stress management, hypnosis, yoga and several bio-feedback procedures (Lehrer, P. *et al*., 1993)

Asthma is the most common chronic ailment among children. It is one of a group of diseases known as chronic obstructive lung diseases that also include bronchitis and emphysema. Asthma is not a modern disease medical lore recognised asthma as early as the time of Hippocrates (400 BCE) and medical literature describe asthma in detail by the second century.

Other promising psychological interventions as adjuncts to medical treatment include training in symptom perception, stress management, hypnosis, yoga, and several biofeedback procedures.

Asthma patients tend to show greater bronchoconstriction than healthy controls in response to stress, both in the laboratory (.Miller and Wood, 1994) and in everyday life (Affleck *et al*., 2000;Ritz, Steptoe, DeWilde, and Costa, 2000). Asthma, rheumatoid arthritis, various endocrine diseases etc. are physiological disorders produced by stress (Brannon and Feist, 1992). Stress-induced asthma exacerbation may be mediated by changes in autonomic function. Beta-sympathetic activation produces broncho dilation, whereas alpha-sympathetic activity and parasympathetic activity produce broncho constriction (Nadel and Barnes, 1984). Although mildly stressful tasks requiring active coping behaviors, such as mental arithmetic, tend to produce bronchodilation among both healthy individuals and those with asthma (Lehrer *et al*., 1996; Smyth, Stone, Hurewitz, and

Kaell,1999) and although patients with panic disorder, whether or not they have asthma, show lower respiratory resistance than corresponding psychiatrically normal groups (Carr, Lehrer, Hochron, and Jackson, 1996). Stress-induced sympathetic activation is often followed by parasympathetic rebound after the stress abates(Lehrer, Hochron, *et al*., 1997; Manto, 1969). This may explain the frequent occurrence of nocturnal asthma symptoms (Ballard, 1999) and, perhaps, the entire phenomenon of stress-induced asthma.

Stress-related exacerbation of asthma and immune system

NHLBI's (1997) guidelines define asthma as an immune system process, but do not include immunologic testing as part of asthma assessment. They note that the role of inflammation in asthma is still an evolving concept (NHLBI, 1997). There is yet little published research on whether stress can exacerbate asthma directly via immune mechanisms. A study (Kang *et al*.,1997) reported a small increase in Th2 cytokine response profile among asthma patients during examination stress. They also found that IL-5 declined among healthy participants but not asthma patients during examination stress. The authors interpreted this pattern as suggesting a vulnerability to stress-related airway inflammatory reactions among people with asthma. Also, long-term exposure to stress can increase susceptibility to respiratory illnesses (Cohen, Tyrell and Smith, 1991), which in turn can exacerbate asthma. A detailed review of stress-induced asthma and the current status of research on mediation by autonomic and immune processes have been published by Rietveld, Everaerd, and Creer (2000).

Werry (1986) pointed out that living with the asthma adds severe stress to the asthmatic and the families. The studies found that asthma is sometimes related to maladjustment in patients and families. This relationship probably involves two causal directions (1) living with asthma sometimes leads to emotional problems and (2) maladjustment in the family increases asthmatic episodes. Asthma episodes vary from person to person. The intensity of the attack also vary from individual to individual. The psychosocial impact of asthma is likely to depend how severe and the condition of disability.

Manoj Gupta (2007) in a study on *tamaka swasa* (bronchial asthma) describe that a majority of the patients with asthma believe that psychological factors, particularly stress can induce asthma attacks but empirical support of actual stress - induced airways obstruction is controversial (Rietveld, S., Van Beest, I., Everared, W., 1999). A study on stress induced breathlessness in asthma by artificially induced stress to 30 adolescent asthma patients and 20 normal individuals of age range 14-19 years explain that all measures confirmed high levels of negative emotions and stress. None of the participants developed airway obstructions. They had no reduction in lung function and cough negligible. However breathlessness, the etiological factors mentioned in *Ayurveda* are similar to that described in modern science. He further describes what, described in *Ayurveda* is also similar to various dust or allergies as described in modern sciences, which is considered one of the precipitating factors of bronchial asthma.

Tieramaa (1988) investigated the connection between life stress factors and onset of asthma in 50 women and 43 men with bronchial asthma. The method such as questionnaire, semistructured psychiatric interview and psychological tests were administered. He reports that different ages with their different challenges and psychosocial stress factors, represent an important factor in the onset of asthma.

Asthma and psychological disorders:

Anxiety and depression

Patients with asthma, especially children, appear particularly likely to suffer from psychological problems, particularly anxiety disorders (Bussing, Burket, and Kelleher, 1996; Vila *et al*., 1999;M. Z. Wamboldt, Schmitz, and Mrazek, 1998). Persons with asthma and co morbid psychiatric disorders have more impaired functioning in both emotional and physical arenas than persons with either disease alone, with poorer control of asthma (Afari, Schmaling, Barnhart, and Buchwald, 2001; Siddique *et al.*, 2000) and greater health care utilization (Brinke, Ouwerkerk, Zwinderman, Spinhoven, and Bel, 2001) despite lack of differences in asthma severity (Brinke, Ouwerkerk, Bel, and Spinhoven, 2001). This association could occur either through disorganization of self-care behavior or by direct physiological effects of anxiety on the autonomic and immune systems. Elevated anxiety and depression have been found to be positively related to asthma severity in children (Mrazek, 1992) but not in adults (Afari *et al*., 2001). Those with asthma, especially children, also appear to be more likely than healthy individuals to experience negative emotions without expressing them

(Hollaender and Florin, 1983; Silverglade, Tosi,Wise, and D'Costa, 1994). However, empirical data as to whether and how negative emotions precipitate or exacerbate asthma attacks are inconsistent (Lehrer, 1998)

The presence and seventy of symptoms of anxiety and depression in individuals with asthma or chronic obstructive pulmmery disease was studied by Carvalho, N.S., *et al*. (2007). 189 arduously and prospectively selected patients that were divided into three study group of 40 patients with controlled asthma, 100 patients with uncontrolled asthma and 49 patients with chronic obstructive pulmonary disease. The findings are, among the asthma patients the prevalence of moderate anxiety was significantly higher than that observed among these with chronic obstructive palimony disease. The uncontrolled asthma group presented significantly higher rates of depressive symptoms than the controlled asthma group

Nowobiliski *et al*. (2007) studied the relationship between the intensity of dypsnea and psychopathological and personality dimensions in 74 women and 38 men of mean age of 49.7 with asthma. It was found that the women had higher scores for the following variables of depressions, anxiety-trait, end neuroticism and they proved to have a greater external control locus than the men. After checking the spirometry results, body mass index (BMI) and gender, it was found, that dyspnea correlated with anxiety trait and anxiety state, neuroticism, and depression. In men anxiety trait modified the relationship between dysphasia, and the duration of the disease. This effect was not found in women. A high level of anxiety trait seems to be responsible for escalation of dyspnea during the progression of the disease

in men, whereas low anxiety may protect them against the increase of dyspnea.

The rrelationship between respiratory illness and neuroticism was reported in an early study by Knapp and Nemetz reported by Alexander, Flap (1965). They conducted psycho physiological studies on 40 patients with chronic, active perennial asthma. A certain degree of neuroticism was found in all their subjects, who ranged from mildly neurotic individuals with mild physical capacity to severely distributed individual with crippling respiratory illness.

A study conducted by Shanmugam and Kaliappan (1982) concluded that asthmatics suffer from highly unsatisfactory adjustment in emotional and health areas due to their high trait anxiety. Regarding anger and fear, emotional behaviour differ in asthmatic children. Also have differences in self control strategies of emotions than normal controls.

Shavitt, Gentile and Croce (1993) conducted a study on 32 year old woman who had asthma attack since the age of 8 yrs. The subject was later diagnosed as having severe anxiety disorder which was mislabeled as asthma earlier. An asthma attack can be a symptom of anxiety sometimes.

Butz, Arlene and Alexander Chery (1993) examined the association between levels of trait anxiety in children with asthma and increased asthma morbidity immediately following an acute asthma attack. The study on 155 children of aged 7-12 diagnosed as asthmatics were administered the State-Trait Anxiety Inventory for Children and reports that almost 75% of children

reported feeling 'panic' at the beginning of the index asthma attack, which was significantly associated with child state anxiety.

Isenberg, Susan A; Lehrer Paul, M and Hochron, Stuart (1992) had conducted a study with 34 ' asthma patients on the effect of suggestion on airways of asthma subjects breathing room air as a suggested broncho constrictor and bronco dilator and the study reveals that the suggestion had a significant effect on perception of bronchial changes, but the correlation between actual and perceived changes was nominal. Correlation among self report variables suggested that the existence of 3 personality dimension among their population related to suggestion and asthma, cognitive susceptibility to suggestion of bronchial change, feeling of physical vulnerability and anxiety. And according to them no significant relationship between airway response to suggested changes and hypnotic susceptibility.

Breathlessness and negative emotions during asthma attacks interact in complex patterns. Rietveld, S. *et al*. (2000) conducted a study on adolescents with and without asthama on 36 adolescents each, assigned with positive imaginary negative imaginary or no imaginary. There were four trials with closing the shields for breath holding combined with imaginary. Breathlessness and quality of imaginary were measured by the level of the breath holding. The lung function and anxiety were also tested the result showed that positive and negative imaginary were only influencing breathlessness in participants with asthma. Although threshold and duration for the groups were not significantly different, participants with asthma reported more breathlessness. The intensity of imaginary enhanced

breathlessness but diminished the accuracy of symptoms perception. Positive imaginary diminished breathlessness in participants with asthma, but also the difference in breathlessness between 75% and 95% of the threshold durations. Breathlessness did not correlate with lung functions, anxiety or other variables. They concluded that emotional imagery during asthma attacks distracts from accurate introspection or enhances breathlessness, irrespective of anxiety.

Asthma: panic symptoms and disorder

Panic disorder appears to be overrepresented among patients with asthma (Carr, Lehrer, and Hochron, 1992; Carr, Lehrer,Rausch, and Hochron, 1994; Karajgi, Rifkin, Doddi, and Kolli, 1990;Shavitt, Gentil, and Mandetta, 1992; Yellowlees, Alpers, Bowden,Bryant, and Ruffin, 1987; Yellowlees, Haynes, Potts, and Ruffin,1988). Approximately 1 asthma patient in 10 has panic disorder. Also, asthma and other chronic respiratory diseases are three times more common in those with panic disorder than among those with other psychiatric disorders or the general population (Spinhoven,Ros, Westgeest, and van der Does, 1994; Zandbergen *et al*., 1991).Among co-occurring psychiatric and respiratory disorders, panic disorder tends to be preferentially associated with asthma, whereas depression is found more often in irreversible airway disease(Kinsman, Fernandez, Schocket, Dirks, and Covino, 1983; Kinsman,Luparello, O'Banion, and Spector, 1973;).Furthermore, patients with high levels of generalized panic–fear have been shown to have higher rates of emergency room visits and general asthma morbidity (Nouwen, Freeston, Labbe and

Boulet, 1999). These findings are consistent with earlier works from the National Asthma Center (Dirks, Kinsman, Jones,and Fross, 1978). The causal direction between asthma and panic may be bidirectional.

Panic may elicit or exacerbate asthma symptoms by several pathways. As described above, the psycho physiological stress response that accompanies panic may elicit autonomic and inflammatory responses among people with asthma, and dyspnea and other unpleasant body sensations accompanying asthma may trigger panic. Although the poor correlation between asthma severity and panic symptoms (Brinke, Ouwerkerk, Bel, and Spinhoven, 2001) might argue against the latter pathway, there are reasons to believe that both mild and severe asthma symptoms might trigger panic, but by different pathways. Symptoms of mild asthma might more easily be confused with panic symptoms, whereas symptoms of more severe asthma are more recognizable and lead to a clearer path of coping behavior, thus decreasing the panicogenic effect.

The frightening nature of severe dyspnea may evoke panic through classical conditioning. Consistent with the possibility that asthma can be a contributing cause of panic disorder are findings that where panic disorder and asthma are comorbid, the respiratory disorder typically precedes the onset of panic disorder (Perna,Bertani, Politi, Colombo, and Bellodi, 1997; Verburg, Griez, Meijer, and Pols, 1995).

Other pathophysiological events may elicit both disorders and, in turn, be elicited by them. Chief among these is hyperventilation, which commonly occurs in panic disorder (Hegel and Ferguson,1997; Papp, Klein, and

Gorman, 1993) and can induce sensations of dyspnea (Chonan, Mulholland, Leitner, Altose, and Cherniack,1990; Hammo and Weinberger, 1999). Hyperventilation cans produce unpleasant body sensations, the fear of which may contribute to panic in susceptible people (Chambless, 1984). Panic–fear is often associated with dyspnea in patients with asthma, and there is some evidence that the squeal of dyspnea may contribute to panic attacks in at least a subset of panic disorder patients (Carr *et al*., 1992).

Hamilton (1955) had cited two studies in which Brown and Goitein studied 40 asthmatics and compared with 40 allergy patients and 20 normals on an objective test battery technique and psychiatric interview by the indirect method. Asthmatics were found as having cyclothymic disposition associated with paranoid features, repressed hostility and self-punishment motives.

Airway obstruction can lead to hyperventilation. Individuals with asthma tend to show an exaggerated increase in respiratory drive in response to experimentally induced respiratory resistance (Kelsen, Fleegler, and Altose, 1979). Because this response is measured during the first 100 ms of the occluded breath i.e., before cortical processing of the occlusion can occur (Davenport, Friedman, Thompson, and Franzen, 1986) and before any observable cortical response, it probably is mediated by brainstem reflexes (Chapman, Santiago, and Edelman, 1980). This reflex, nevertheless, appears to contribute to hyperventilation independently of panic, although the hyperventilation symptoms, combined with fear of body sensations in susceptible people, may subsequently induce panic.

Hyperventilation tends to be very common in asthma (Thomas, McKinley, Freeman, and Foy, 2001),and it can cause bronchoconstriction through pathways of cooling and, to a lesser extent, drying of the airways (Gilbert, Fouke, and McFadden, 1988; Kilham, Tooley, and Silverman, 1979; McFadden,Nelson, Skowronski, and Lenner, 1999). The contribution of hyperventilation to panic disorder remains in dispute (Bass, 1997; Garssen,Buikhuisen, and van Dyck, 1996). It is not present in all cases of panic disorder and may be only an epiphenomenon when it does occur, and anxiety can be absent during hyperventilation (Bass and Gardner, 1985) or secondary to it (Lum, 1976). However, it provides a plausible mechanism for the common co-occurrence of the two disorders and should be a subject for further, more targeted, research. Its contribution as an asthma trigger has been better substantiated (Lehrer, 1998).

Another possible bidirectional pathway is shared respiratory deregulation that may contribute to the pathophysiology of both problems (Smoller, Pollack, Otto, Rosenbaum, and Kradin, 1996). For example, the experience of dyspnea in both disorders may be linked by CO_2 sensitivity. Medullary chemoreceptor and the locuscoeruleus may be stimulated by bronchoconstriction in asthma, inducing the expression of an underlying vulnerability to panic (Perna *et al*., 1997; Svensson, 1987). Repeated stimulation of chemoreceptor may lead to dysfunction of the brain's suffocation alarm system, posited by Klein (1993) to underlie the development of panic disorder. This mechanism may stimulate hyperventilation (Papp *et a*l., 1993), thus exacerbating both panic and asthma.

The relationship between panic disorder and asthma is not a specific one. There is a higher prevalence of non respiratory diseases, such as cardiovascular and cerebro vascular disease, among panic disorder patients than among those with other psychiatric disorders or those with no psychiatric disorder (Weissman, Markowitz, Ouellette, Greenwald and Kahn, 1990). In addition, panic disorder and asthma seem to be independently transmitted in families of those with asthma (Perna *et al*., 1997).

Asthma and depression

The relationship between asthma and depression, also may be bidirectional. Miller and Wood (1997) demonstrated that film-induced sadness can produce bronchoconstriction among children with asthma. Also, the well known relationship between depression and an attitude of helplessness (Peterson and Seligman, 1984; Seligman, Abramson, Semmel, and von Baeyer, 1984) may create conditions for a passive behavioral response to stress, which appears to be particularly associated with vagal activation (Inamori and Nishimura, 1995; Roozendal, Koolhas, and Bohus, 1997). On the other hand, some of the common effects of asthma also can contribute to depression, particularly fatigue, disability, and self-perception as being sick. Bell, Jasnoski, Kagan, and King (1991) found more allergies and a higher rate of asthma among people reporting a greater number of depressive symptoms in a non clinical sample of 379 college students. There also may be a genetic link between asthma and certain mood disorders (Wamboldt, Weintraub, Krafchick,and wamboldt, 1996; . Wamboldt *et al*., 2000).

Asthma symptoms and behavioral conditioning

Asthma symptoms and behavioral conditioning is not a newly observed phenomenon, the classical conditioning of respiratory symptoms has been the topic of considerable research in the past years (Ley, 1994). Van den Bergh and colleagues have shown that odors and other stimuli can serve as conditional stimuli for eliciting respiratory symptoms and complaints in healthy individuals (van den Bergh, Kempynck, van den Woestijne,

Baeyens, and Eelen, 1995) as well as among individuals reporting hyperventilation complaints (van den Bergh,Stegen, and van de Woestijne, 1997). Other studies have demonstrated conditioned respiratory responses to fear-relevant images or conditional stimuli associated with stress (Ley, 1994; Miller and Kotses, 1995; Stegen, De Bruyne, Rasschaert, van de Woestijne, and van den Bergh, 1999) and generalization of odor conditioned responses to new odors (Devriese *et al*., 2000).

Asthma symptom perception

The ability to detect changes in the condition of the airways may have important clinical implications for people with asthma. Underestimaters may not take prescribed medications and may delay seeking medical attention, which could lead to disastrous consequences, whereas overperceivers may take excessive medication, experience side effects, and overuse health care resources. People tend to rely on their subjective perceptions of symptoms more than they do on objective findings to guide medication consumption (Apter *et al*., 1997; Priel, Heimer, Rabinowitz, and Hendler, 1994),and numerous studies have found major discrepancies between perception of respiratory symptoms and actual airway obstruction, caused either by asthma or by external resistive loads (Kendrick,Higgs, Whitfield, and Laszlo, 1993; Nguyen, Wilson, and German, 1996; Rietveld, Prins, and Kolk, 1996; Rushford, Tiller, and Pain,1998). Rietveld, Kolk, Prins, and Colland (1997) showed that listening to false sounds of wheezing after exercise increases report of breathlessness among children with asthma, independent of actual pulmonary function.

Women with asthma have greater mortality and morbidity than men in the United States (Clark N.M. *et al*., 2007). According to Clark, there has been no rigorous evaluation of an intervention focused on the particular problems in asthma management faced by women. A randomized clinical trial of a self regulation, telephone counseling intervention emphasizing women's concerns and sex and gender role factors in their management of asthma. Such an intervention improved women's clinical status, functioning, quality of life and health care use.

Asthma: psychological interventions

This review of interventions for asthma management that target patients' knowledge, beliefs, and behavior. The enhancement of knowledge through educational interventions is crucial for disease management and has been well integrated into many disease management programs. By contrast, there is a striking dearth of interventions that address beliefs, behavior, and perceptions or that routinely screen for and treat conditions associated with poor asthma management or outcomes such as co morbid psychiatric conditions, family dysfunction, or poor communication between patient and provider. For example, asthma management programs have used physician education (Hendricson *et al*., 1994), peer education (Persky *et al.,* 1999), and innovative educational methods, such as multimedia and computer-based programs (Bartholomew *et al*., 2000; Homer *et al*., 2000) to convey information, but an individualized focus on dysfunctional cognitive–behavioral variables is lacking.

Asthma*:* psycho education

The NHLBI's (1997) guidelines emphasize the importance of education in the treatment of asthma. They recommend that a written action plan instruct patients to take medication and to contact health care providers according to various zones of asthma severity that correspond to the colors of a traffic light. The zones are based on a combination of symptoms and peak flow values. The guidelines also recommend including the following components in asthma education: instructing the patient about basic facts of asthma and the various asthma medications; teaching methods for self-monitoring of asthma symptoms, including competent use of a peak flow meter; teaching techniques for using inhalers and avoiding allergens; devising a daily self-management plan; and completing an asthma diary for self-monitoring.

An investigation on cost effectiveness evidence on pharmacological treatment of asthma patients done by Rutten-Van Molken, *et al*. (1992) establish that health education directed to asthmatic children seems to reduce health care costs and improve attitude compliance behaviour and self management skills.

Asthma education has been shown to be cost effective for both children (Greineder, Loane, and Parks, 1999) and adults (Taitel, Kotses, Bernstein, Bernstein, and Creer, 1995). Numerous empirically validated educational programs are available for asthma patients of all ages, some of which have demonstrated improvements on measures such as frequency of asthma attacks and symptoms, medication adherence, and self-management skills (Kotses *et al*., 1995)

Asthma education also has been shown to increase self-efficacy and internality on health locus of control (Bruzzese, Markman, Appel and Webber, 2001; Tieffenberg, Wood, Alonso, Tossutti, and Vicente, 2000; Wigal *et al*., 1993). However, although these programs are effective when examining various parameters of morbidity, it has not yet been shown that changes in self-efficacy or locus of control mediate these improvements in asthma self management. Understanding the mechanism of behavior change may allow for further integration of cognitive–behavioral techniques, motivational enhancement, and basic asthma education principles.

Asthma*:* Individualized self-management

In addition to adapting educational programs for high-risk populations, self-management plans can be tailored to the specific needs of individual patients. Typically, personalized plans are developed either from interviews with the patient or from self monitoring during a baseline period (Kotses, 1998). Individualized programs have been shown to reduce the number of asthma attacks (Kotses, Stout, Mc Connaughy, Winder, and Creer, 1996) and asthma symptoms (Evans *et al*., 1999). Wilson *et al*. (1993) found that personalized self-management was associated with better environmental control and inhaler technique. However, comparable benefits were found in a small-group educational program, a more cost-effective and supportive forum. Individualized training might most easily be accomplished in the physician's office during periodic reviews of asthma status, as recommended by NHLBI (1997).

Asthma: cognitive interventions, psychotherapy, and family therapy

The few studies that have examined the use of psychotherapy as an adjunctive treatment for asthma have been limited by the use of small sample sizes. Sommaruga *et al*. (1995) combined an asthma education program with three sessions of cognitive–behavioral therapy (CBT) focusing on areas that may interfere with proper medical management. Few significant between-group differences on measures of anxiety, depression, or asthma morbidity emerged between a control group receiving medical treatment alone and the CBT group. In an uncontrolled study, Park, Sawyer, and Glaun (1996) applied principles of CBT for panic disorder to children with asthma reporting greater subjective complaints and consuming excessive medication. In the 12 months following treatment, rate of hospitalization for asthma decreased, but other measures of clinical outcome were not analyzed. We have recently combined components of asthma education and CBT for panic disorder to develop a treatment protocol appropriate for adults with both asthma and panic disorder (Feldman, Giardino, and Lehrer, 2000). This treatment is currently being empirically evaluated. There also is evidence from two controlled studies that family therapy can lead to improved asthma symptom control in some cases of severe childhood asthma (Gustafsson, Kjellman, aand Cederbald, 1986; Lask and Matthew, 1979). However, the samples and effect sizes in these studies were small, and the results were inconsistent. It is possible that family therapy may be most helpful for families in which interpersonal difficulties interfere with carrying out the complex medical regimen required by children with severe asthma.

According to French and Johnson psychotherapeutic situations in asthma offers an opportunity for the patient to confess what is disturbing in him, if the asthmatic patient can gain confidence to confess fully and freely the impulses that are at the moment responsible for his fear of estrangement from some other substitute, then the patient feel relief from asthma attack until some new forbidden impulses arises to disturb (Alexander C.F. and Flag, 1965). The study points to the psychological triggering of asthmatic reaction.

Written emotional expression exercises: an intervention method

Several reports have been published promoting the health benefits of emotional disclosure of psychologically traumatic experiences through writing (e.g., Esterling, Antoni, Fletcher, Margulies, and Schneiderman, 1994; Pennebaker, Kiecolt- Glaser and Glaser, 1988). Smyth *et al*. (Smyth, 1998; Smyth, Stone, *et al*., 1999) asked study participants to write an essay expressing their thoughts and feelings about a traumatic experience and found a clinically significant improvement in FEV1 (forced expiratory volume-1) among asthma patients after a 4-month follow-up, with no improvement noted in a control group who wrote on innocuous topics. In a later analysis, they reported that these effects were not mediated by perceived stress, quality of sleep, affect, substance use, or medication use (Stone, Smyth, Kaell, and Hurewitz, 2000).

Asthma*:* other psychosocial interventions

There are many studies evaluated the effects of a psychological intervention on the immune–inflammatory system in asthma. Caste´s *et al*.

(1999) provided children with asthma a 6-month program that included relaxation/guided imagery, cognitive stress-management therapy, and a self-esteem workshop. Improvement attained both in clinical measures of asthma and in asthma-related immune system measures. The treatment group, but not a control group that received only medical treatment, significantly decreased their use of medication, showed improvements in FEV1, and, at the end of treatment, no longer showed a response to bronchodilators (consistent with improvement in asthma). Basal FEV1 improved to normal levels in the treatment group after 6 months of treatment. Children in the treatment group showed a significant reduction in specific IgE (immunoglobulin-E) responses against the most common allergen in the study population. Stimulation of IgE responses by environmental allergens is an important contributor to asthma exacerbations. Treatment group children also exhibited increased natural killer cell activity and a significantly augmented expression of the T-cell receptor for IL-2 (interleukin-2). Natural killer cells produce agents that inhibit IgE synthesis, and IL-2, an immune system messenger molecule, acts to suppress lymphocyte activity associated with atopy.3

A study of Backwin and Backwin (1992) cited by Sarafino (1998) states that psychosocial factor play a major role in asthma. Their study on children with asthma says that one third of asthmatic children show reduced symptoms shortly after admission to the hospital even through their medication is not changed. Same time when they returned home the symptoms reappeared.

Long *et al.*, in a study (cited by Sarafino, 1981.) found that children who have asthma at home are diagnosed as allergic asthma were not exhibited asthma symptom when they were exposed to hospital room with the same dust particles of their bedroom. This also shows that psychosocial factors have a major role with asthma.

Asthma is prevalent in all over the world. The prevalence rate are high among children compared with the adult and especially boys. (Gergan, Mullally and Evans, 1988).

Asthma attacks appear to result from some combinations of three factors: allergies, respiratory infections and biopsychosocial arousal, such as from stress (Busse, 1990 cited by Sarafino E.P. 1998). In most cases the cause of an attack is largely physical, but sometimes it may be largely psychosocial.

Asthma attacks are frightening for the patient and family alike and frequent episodes disrupt these people's family life and functioning (Cluss and Fireman 1985).

A study conducted by Bakman *et al*. (1981) in treating chronic asthma patient with a medicopsychosocial approach says that there are 6 factors that affected the course of asthma as continuing symptoms frightening hospital experiences, school difficulties, difficulties in the family, family economy and housing condition. Further he says that a child's asthma threatens the family's equilibrium causing problems in both intra and extra familial activities. Treatment and information about the disease should be directed at the family unit.

26 parents of asthma were studied for a weekly teaching session for 4 months by Brook *et al*, (1993) and after one year both the groups who had attended the session and who had not attended are studied and the result shows a statistically significant lower hospitalization rate of their asthmatic children. In another study he reports that the increasing parental knowledge of asthma decreases hospitalization of the child.

Psychosocial factors play an important role in outcomes of asthma. Perceived control a measure of patients' belief about their ability to control their disease, has a significant role in association with asthma health outcomes (Calfee *et al*., 2006).

Asthma and Personality

Otten R. *et al* (2008) examined the role of personality and environment in smoking of asthmatic and nonasthmatic adolescents. Information about asthma, smoking, personality and environmental smoking was assessed using self reports. Both personality and environmental smoking were associated with smoking. Aarthritics were similarly or even more exposed to environmental smoke than non asthmatic adolescents and asthmatic adolescents were less emotionally stable and extravert. Association between personality and own smoking behaviour as well as between smoking models and own smoking behaviour were similar for asthmatics and nonasthmatics.

The study of Malik and Sabharwal Madhulika (1998) reveals that personality structure of individual leads to psychosomatic problems. They conducted a study on personality characteristics of psychosomatic patients including 20 bronchial asthma patients. The investigators reached in a conclusion that personality correlates indicate association with personality traits like sensitive, effeminate, absent minded and immature in practical judgement having calculating mind, fastidious, socially polished and temperamentally radical and they are likely to repress their hostility and introject it.

By using Cattell's 16 P.F test, Rosenthal, Aikken and Zeally have sketched the personality profile of asthmatics as submissive humble toughminded and radical individuals. Asthmatics are found to be introverted, neurotic and anxious (Sreedhar, 1978).

Knapp and Nemetz also found a high positive correlation between the severity of the personality disturbance, which had often existed years before the development of asthma. (Alexander, C.F. and Flagg, 1965).

Effects of psychological treatments on the pathophysiology of asthma

In addition to psychological interventions targeted at health care behaviors or stress management, research is continuing on the methods by which people can learn to exercise direct control over physiological processes involved in asthma. These methods have included various relaxation methods, biofeedback, hypnosis, and yoga.

Relaxation Training

Many tense or agitated individuals with psychosomatic complaints derive immense benefit from relaxation training. Lehrer, Sargunaraj, and Hochron (1992) explained that relaxation training has often been statistically significant but small and inconsistent effects on asthma, particularly after several weeks of training, although the immediate effect may be a worsening of pulmonary function due to parasympathetic rebound. It is not clear whether the effectiveness depends on whole body relaxation or specifically facial or respiratory muscle relaxation, during relaxation, respiration usually becomes slower, pulse rate and blood pressure decrease and a noticeable claming effect ensures (Lehrer, Sargunaraj and Hochroan, 1993). Lowered metabolic state is often associated with health is generally accepted in holistic and alternative medicine

Vazquez, Isbel and Buceta (1993) investigated the effectiveness of self management programmes and relaxation training in the treatment of bronchial asthma. 27 asthma patients of age 8–13 with light to moderate asthma were studied. Patients were divided into three groups. The first group received an asthma self management programme and the second received the same programme with relaxation training and third, the control group received only pharmacological treatment. After 6 and 12 months follow up result shows that a significant decrease in asthma attack duration and improvements in peak respiratory flow rate with respect to the second group than the other two groups.

Spevack (1978) in an extensive study with asthma patients explained that behaviour therapy techniques have some apparent success. He pointed out that an autonomic conditioning component can occur in asthma and pulmonary function, is improved when subjects are in a relaxed state. Further he says that, though a significant effect have been found for relaxation therapy, it is not clear whether the effectiveness depends on whole body relaxation or specifically facial or respiratory muscle relaxation. Active components in these methods remains to be identified as do the populations who they can best serve.

A study on improvement of respiratory function in chronic asthmatic patients with autogenic therapy by Henry, Manuel, de Rivera, Gouzales-Martin and Abreu (1993) on the role of stress, unpleasant emotions, and autonomic imbalance in the precipitation of Asthma attacks. In this study 29 asthmatics patients of age within 18-58 years are evenly divided into two

groups and treated over an eight month period with autogenic therapy and suggestive group therapy. It was found that autogenic therapy obtained a relevant clinical improvement in respiratory function than the suggestive group therapies

Deter and Allert (1983) investigated the effect of psychosomatic group therapy among asthma patient who were having the illness with an average duration of 16.8 years. In this study 31 asthma patients were randomly divided in to three groups. Two treatment groups got the benefit of exchanging information, had a discussion session on the illness as well as 'autogenic training' or 'functional relaxation'. The third group was the control group. Subjects were submitted to a thorough physical and psycho-diagnostic examination before and after the treatment session.

Immunoglobulin and asthma

Immunoglobulins (Igs) are proteins that act as antibodies in the immune system. Antibodies react to antigens, substances that induce immune sensitivity or responsiveness. Igs are classified (A, D, E, G, M) on the basis of the structural and antigenic properties of their protein chains. An important component of asthma is the stimulation of IgE responses by environmental allergens. This stimulation leads to mast cell activation, which results in the release of vasoactive and bronco constrictive agents, which attract inflammatory cells to the area. Interleukin-2 is a cytokine derived from T helper lymphocytes that causes proliferation of T lymphocytes and activated B lymphocytes. This lymphocyte activity, called a Th-1 profile, acts to suppress lymphocyte activity associated with atopy3 (i.e., the Th-2

profile). T helper cells are a subset of lymphocytes that secrete various cytokines that regulate the immune response.

Biofeedback training

The investigation of bronchial constriction followed by training in broncho dialation through biofeedback reinforcement by Khan, Staerk and Bonk, (1973).on 20 asthma patients between 8 and 16 years of age in a one year follow up shows that improvement in the experimental group was significantly greater than the control group with regard to the frequency of asthma attack and the amount of medication during that period

Family therapy

Family therapy is also helpful as far as asthma patients are concerned because the family and the environment where the patient dwells, sometimes induces asthma. So a therapy for the family member also help the patient to overcome the recurrence of asthma attack. Behaviour therapy denotes the use of experimentally established principles of learning for the purpose of changing unadaptive behavior. The therapy helps the patient to modify their behaviour and behaviour pattern. (Arnold and Lazarus, 1971

Yoga based studies

Yoga is a system for the complete development of the physical, mental, intellectual, vital and spiritual aspects of a human being. It is a methodical conscious effort towards self perfection by the unfoldment of the talent potentialities in an individual. In practice it is a technique of calming down of the mind. It is the hypersensitivity and psychological conflicts leading to emotional upsurges that cause stresses at the subconscious level. This may percolate in to the physical frame manifesting as diseases. Hence yoga in its general methodology of perfecting an individual, through removal of stresses, contains the therapeutic aspects of treating such stress-induced disease. Bronchial asthma, characterised by episodic airway obstruction with intervals, normally is a well recognised psychosomatic ailment.

Yoga is historically a spiritual discipline, it has also been used clinically as a therapeutic intervention. Yoga therapy is a relatively novel and emerging clinical discipline within the broad category of mind body medicine. Its growth is consistent with the burgeoning popularity of yoga in the West and the increasing world wide use of alternative medicine (Khalsa, 2004).

Practice of yoga helps to reduce neuroticism anxiety and hostility. It enhances the perpectual mother function of an individual, that leads to a positive mental health. Further it says that regular practices of yoga produce a shift of autonomic balance towards the parasympathetic side and increased homeostasis. The overall muscular fitness and physical efficacy also increases by the regular practice of yoga (Selvamurthy, *et al*., 1983).

Grover et *al*., (1988) reported that yoga therapy produced a significant change on individuals who are having chronic neurotic problems. The psychological tests he has given to those individuals who are having anxiety and depression showed a significant reduction in anxiety, depression and psychiatric disability including social, vocational and personal. Other neurotic symptoms like hysteria and obsession also have a significant reduction.

The studies of Balakrishan *et al*., (1977); Grover *et al*., (1988) say that the comparative study of drug therapy with yoga therapy provided a significant result that yoga therapy to be more effective than drug therapy.

The studies by K. Sridevi and P.V. Krishna Rao on temporal effect of meditation and personality indicated that, the transcendal meditation (TM) has manifold positive effects on the personality. Studies on yoga and meditation are reported by many researchers (cited by Shaffi *et al*., 1974).

Enlightenment resulting from the meditation practice is nothing but fulfilment of one's drive towards wellbeing. A person who is enlightened means that the full awakening of the total personality to reality (Fromm, 1960, Jung, 1969).

The effectiveness of meditation as a treatment in clinical settings depends on both the study and prolonged practice of the technique and the longer the meditation practices the greater the increase in concentration.

A significant effect of yoga on mental and physical health was reported by Walia *et al*., (1989). The study says that the 71 persons who

have participated 3 months of yoga training showed a significant improvement in physical and mental health and reduction in neuroticism and depression.

Manjari Saxena *et al*., (2007) in a study with 50 asthma patients on various breathing exercise (*pranayama*) and meditation in a 12 week period found that a significant improvement from symptoms of asthma. Further the study says that breathing exercise (*pranayama*) improves the patients respiratory capacity and decrease sensitivity of lungs to various stimuli.

Jain S.C. *et al*., (1991) conducted a study with 46 asthmatics having a history of childhood asthma with yoga training found that a significant increase in pulmonary functions and capacity. A two year follow-up study showed a good response with reduced asthma symptom and reduced requirement of medicines.

In another study by Jain, S.C. and Tendulkar B. (1993), 46 patients of chronic bronchial asthma, on the effect of yoga therapy programme including exercise capacity, pulmonary functions and blood gases. A one-year follow up study resulted in an increase in pulmonary functions and reduced asthma symptoms and drug requirement.

Nagarathna, R. and Nagendra, H.R. (1985) found that integrated set of yoga exercise including breathing exercises, physical postures, breath slowing techniques, meditations and a devotional session has a significant improvement in the treatment of bronchial asthma. Fifty three asthma patient who underwent the session for two weeks with 65 minutes daily

practices has shown a significant improvement when compared with fifty three control group of asthma patients.

Nagendra, H.R. and Nagarathna, R. (1986) in an extensive study on asthma using an integrated yoga training programme of 2 to 4 weeks of 570 asthma patients followed up for 3 to 54 months showed a significant improvement on asthma symptoms and more than 72% of the patients stopped or reduced medication.

The efficacy of nonpharmacological approaches of naturopathy, yoga and diet therapy in bronchial asthma patient was studied by Sathyaprabha *et al*., (2001), on 37 asthma patients with various parameters including lung function test. The result showed a significant improvement in peak expiratory flow rate (PEFR), ESR and absolute eosinophil count.

Manocha *et al*., (2002) conducted a study using Sahaja yoga in the management of moderate to severe asthma. A four month study by providing 2 hrs yoga session in a weeks showed a significant improvement in the asthma symptoms. The main areas of the study were asthma related quality of life (AQOL), profile of mood states (POMS), level of hyper responsiveness to methacholine (AHR) and a diary card based combined asthma score (CAS) reflecting symptoms, bronicho dilator usage and peak expiratory flow rates. In comparison with the control group a significant improvement in the level of airway hyper responsiveness to methacholine (AHR), and asthma related quality of life (AQQL) was found among the yoga practised group

Khanam (1996) conducted a study on 9 asthma patients by yoga training for seven days. The variables such as parasympathetic reactivity, sympathetic reactivity and pulmonary function tests were recorded before and after yoga training. The result indicated that the resting heart rate after yoga training was significantly decreased and there is a significant reduction in sympathetic reactivity and improvement in pulmonary ventilation by way of relaxation of voluntary inspiratory and expiratory muscles.

Cusumano *et al*. (1993) in a study on the short term psychophysiological effects of hathayoga and progressive relaxation on female Japanese students says that on a three week treatment session of hathayoga were very effective in lowering heart rate and blood pressure and improvement in self esteem perception of physical self.

Dostalek (1994) in his study on physiological bases of yoga technique in the prevention of disease says that the practice of *hathayoga* can produce a lot of changes in the intensity and distribution of excitation and inhibition in the brain, habituation of relaxogenic areas and modification of the rhythmicity of the functions. He also says that *hathayoga* can be used for prevention and therapy of psychosomatic disease including asthma.

Vijayalakshmi, *et al*. (1988) found that yoga and psychotherapy are very useful in the management of asthma, infact, be superior to conventional medical treatment. Data on peak expiratory flow rate collected from the experimental subject before and after a 10 days asthma camp are counter checked with the control subjects who attended medical clinics.

Lane, D.J. (1994) found that therapies such as hypnosis and yoga appears to have some degree of efficacy but rarely as great as that achieved with conventional pharmaceuticals. But this study does not say any thing about the long term effect of both the therapies.

Swami, G.K. and Swami, R.K. (2006) Studied 150 patients with *tamaka swasa* (bronchial asthma) to evaluate the comparative efficacy of *anayurvedic* preparation along with certain eliminatory procedure of *pancha karma*. The result were assessed in terms of clinical recovery and functional improvement. The result obtained by the treatment are highly significant on both subjective and objective parameters. The pancha karma procedures might have resulted in purification and rejuvenation of the body systems responsible for asthma.

Overview of the review

Many researchers extensively done on asthma describes the mechanism behind the operation of its symptoms. The psychological influences in triggering asthma are established in many studies. But the exact nature of its psychophysiological operations are still vague. Many studies have proved that psycho-physiological interventions such as yoga, meditation, relaxation training are superior remedial methods over drug therapies. One important variable of nutrition (not food alone) and associated toxemic condition in the eteology of asthma is a neglected area in asthma research.

The present study is an attempt to establish an efficient therapy package of psychonutritional cure for asthma. It also aims to evaluate the theory and practice of asthma therapy of various systems of medicine.

CHAPTER III

METHODOLOGY

METHODOLOGY

This chapter deals with the methodology to evaluate the prevailing therapies of asthma and establish an efficient therapy package for curing asthma. This methodology is to examine the etiological concepts of asthma envisaged in various systems of medicine and prognostic status of each system in the light of the efficacy of the therapy package of psychonutritional cause for asthma.

Research Design

Pre test post test design is accepted in this methodology. The analases made in this research are of quantitative and qualitative nature.

Aims of this study

The major aim of the study is to examine the prognostic status of the prevailing systems and arrive at an efficient method of cure and therapy package. The study is also aimed at investigating the psychodynamics of bronchial asthma. It examines the various etiological and therapeutic foundations envisaged in various systems of Medicine.

Objectives

1. To asses the prognostic status of asthma in various systems of medicine

2. To arrive at an efficient cure method for asthma by proving the efficacy of a therapy package.

3. To find out the etiological concepts described in various systems of Medicine in relation to the present therapy intervention.

4. To asses the therapeutic procedures prevailing in various systems of Medicine in comparison to the present therapy intervention.

5. To establish the psychodynamics of asthma in the light of the present study.

Hypotheses formulated

1. The prognostic status of asthma in various systems of Medicine is very poor.

2. The body weight of the asthma patients will come towards normal status after the therapeutic intervention.

3. The blood pressure of the asthma patients will attain a normal status after the therapy intervention.

4. The hemoglobin content of the asthma patients will come towards normal status after the therapeutic intervention.

5. The RBC count of the patients will come towards normal status after the therapeutic intervention.

6. The WBC count of the patients will come towards normal range after the therapeutic intervention.

7. The polymorph count of the patients will come towards normal status after the therapeutic intervention

8. The lymphocytes count of the patients will attain a normal status after the therapeutic intervention.

9. The eosinophil count of the patients will come towards normal status after the therapeutic intervention.

10. The ESR rate of the patients will come towards normal status after the therapy intervention.

11. The blood sugar of the patients will come towards normal status after the therapeutic intervention.

12. The blood urea of the patients will come towards normal status after the therapeutic intervention.

13. The albumin in the urine will be normalized in patients after the therapy intervention.

14. The etiological concepts envisaged in various systems of Medicine are different.

15. The therapeutic procedures prevailing in various systems of Medicine are efficient in curing asthma.

16. There exists a clear psychodynamics of asthma.

Sample

The sample consists of 38 male and 26 female within the age range from 12 to 73 who voluntarily sought admission in holistic cure camps.

Table.3.1

Age wise distribution (in year) of the total sample (n=64)

Age group	12-19	20-29	30-39	40-49	50-59	60-69	70-73	Total
Male	3	6	9	6	13	0	1	38
Female	2	1	2	9	8	2	2	26
Total	5	7	11	15	21	2	3	64

Physiological and psychological variables studied and their measures and tools

These variables are commonly used in diagnosis which are decided on expert opinions from medical practitioners. It also gives an overall indication about any unnoticed medical complications other than asthma. These measures are often interrelated. They are fundamental to any clinical diagnosis and assessment of well being.

Physiological Measures

1. Body weight
2. Blood pressure
3. Hemoglobin
4. Red blood cells (RBC)
5. White blood cells (WBC)
6. Polymorph (granulocyte)
7. Lymphocytes
8. Eosinophils

9. Erythrocytic sedimentation rate (ESR)
10. Blood sugar
11. Blood urea
12. Albumin (urine)

Psychological variables

The inertia- activation- stability (*thama-raja –satva gunas*) are primary and functional aspects of personality envisaged in the time-tested *darsan* or holistic vision of the East. The status of each variable is an indication of health and pathology in an individual.

13. Inertia dimension of personality
14. Activation dimension of personality
15. Stability dimension of personality

1. The body weight

The term body weight is overwhelmingly used in daily English speech and in biological and medical science contexts to describe the mass of an organism's body. Body weight is measured in kilograms throughout the world, although in some countries people more often measure and describe body weight in pounds

The term is usually encountered in connection with the following.

- food and feeding behaviour
- normal and abnormal growth and development
- the physiological and hormonal control of ingestion and digestion

- hunger and other motivations to eat
- problems in regulating body weight, often resulting in obesity
- eating disorders such as anorexia nervosa and bulimia nervosa
- effects of disease
- athletic competitions where the participants are classified according to their body weight

Body weight is associated with many pathology conditions. It is influenced by genetic predisposition, nutritional style, environmental conditions etc. A normal body weight is often assessed in relation to height and other physiological and anatomical conditions A sudden decrease or increase in weight is often associated with pathology. Normal body weight is a primary requirement of health variables which is regulated through various psychological process.

2. Blood pressure

Blood pressure refers to the force exerted by circulating blood on the walls of blood vessels, and constitutes one of the principal vital signs. The pressure of the circulating blood decreases as blood moves through arteries, arterioles, capillaries, and veins; the term *blood pressure* generally refers to arterial pressure, i.e., the pressure in the larger arteries, the blood vessels that take blood away from the heart. Arterial pressure is most commonly measured via a sphygmomanometer, which historically used the height of a column of mercury to reflect the circulating pressure. Today blood pressure values are still reported in millimeters of mercury (mmHg), though aneroid and electronic devices do not use mercury.

The systolic arterial pressure is defined as the peak pressure in the arteries, which occurs near the beginning of the cardiac cycle when the ventricles are contracting ; the diastolic arterial pressure is the lowest pressure during the resting phase of the cardiac cycle. The average pressure throughout the cardiac cycle is reported as mean arterial pressure; the pulse pressure reflects the difference between the maximum and minimum pressures measured.

Typical values for a resting, healthy adult human are approximately 120 mmHg systolic and 80 mmHg diastolic (written as $^{120}/_{80}$ mmHg, and spoken as "one twenty over eighty") with large individual variations. These measures of arterial pressure are not static, but undergo natural variations from one heartbeat to another and throughout the day (in a circadian rhythm); they also change in response to stress, nutritional factors, drugs, or disease. Hypertension refers to arterial pressure being abnormally high, as opposed to hypotension, when it is abnormally low. Along with body temperature, blood pressure measurements are the most commonly measured physiological parameters.

The *auscultatory* method uses a stethoscope and a sphygmomanometer. This comprises an inflatable (*Riva-Rocci*) cuff placed around the upper arm at roughly the same vertical height as the heart, attached to a mercury or aneroid manometer. The mercury manometer, considered to be the gold standard for arterial pressure measurement, measures the height of a column of mercury, giving an absolute result without need for calibration, and consequently not subject to the errors and

drift of calibration which affect other methods. The use of mercury manometers is often required in clinical trials and for the clinical measurement of hypertension in high risk patients, such as pregnant women.

A cuff of appropriate size is fitted and inflated manually by repeatedly squeezing a rubber bulb until the artery is completely occluded. Listening with the stethoscope to the brachial artery at the elbow, the examiner slowly releases the pressure in the cuff. When blood just starts to flow in the artery, the turbulent flow creates a 'whooshing' or pounding (first Korotkoff sound). The pressure at which this sound is first heard is the systolic blood pressure. The cuff pressure is further released until no sound can be heard (fifth Korotkoff sound), at the diastolic arterial pressure. Sometimes, the pressure is palpated (felt by hand) to get an estimate before auscultation.

While average values for arterial pressure could be computed for any given population, there is often a large variation from person to person; arterial pressure also varies in individuals from moment to moment. Additionally, the average of any given population may have a questionable correlation with its general health, thus the relevance of such average values is equally questionable. However, in a study of 100 subjects with no known history of hypertension, an average blood pressure of 112/64 mmHg was found, which is in the normal range.

In children the normal ranges are lower than for adults. In the elderly, blood pressure tends to be higher than normal adult values, largely because of reduced flexibility of the arteries. Factors such as age, gender and race

influence blood pressure values. Pressure also varies with exercise, emotional reactions, sleep, digestion and time of day.

The following classification of blood pressure applies to adults aged 18 and older. It is based on the average of seated blood pressure readings that were properly measured during 2 or more office visits.

Classification of blood pressure for adults		
Category	**Systolic blood pressure**	**diastolic, mmHg**
Hypotension	<90	or <60
Normal	**90–119**	**and 60–79**
Pre hypertension	120–139	or 80–89
Stage 1 Hypertension	140–159	or 90–99
Stage 2 Hypertension	≥160	or ≥100

3. Hemoglobin

Hemoglobin (Hb or Hgb) is the iron-containing oxygen-transport metalloproteinase in the red blood cells of vertebrates. . In mammals, the protein makes up about 97% of the red cell's dry content, and around 35% of the total content (including water). Hemoglobin transports oxygen from the lungs or gills to the rest of the body, auch as to the muscles, where it releases the oxygen for cell use. It also has a variety of other roles of gas transport and effect-modulation which vary from species to species, and are quite diverse in some invertebrates.

Hemoglobin (Hb) is synthesized in a complex series of steps. The heme part is synthesized in a series of steps in the mitochondria and the

cytosol of immature red blood cells, while the globin protein parts are synthesized by ribosomes in the cytosol.

Production of Hb continues in the cell throughout its early development from the proerythroblast to the reticulocyte in the bone marrow. At this point, the nucleus is lost in mammalian red blood cells, but not in birds and many other species. Even after the loss of the nucleus in mammals, residual ribosomal RNA allows further synthesis of Hb until the reticulocyte loses its RNA soon after entering the vasculature (this hemoglobin-synthetic RNA in fact gives the reticulocyte its reticulated appearance and name).

4. Red blood cells (RBC)

Red blood corpuscles are the most common type of blood cell and the vertebrate body's principal means of delivering oxygen to the body tissues via the blood. The cells are filled with hemoglobin, a biomolecule that can bind to oxygen. They take up oxygen in the lungs or gills and release it while squeezing through the body's capillaries. The blood's red color is due to the color of hemoglobin. In humans, red blood cells develop in the bone marrow, take the form of flexible biconcave disks, lack a cell nucleus,

Red blood cells are also known as RBCs, red blood corpuscles (an archaic term), haematids or erythrocytes (from Greek *erythros* for ‘red’ and *kytos* for ‘hollow’, with *cyte* translated as "cell" in modern usage). The capitalized term Red Blood Cells is the proper name in the US for erythrocytes in storage solution used in transfusion medicine.

Erythrocytes consist mainly of hemoglobin, a complex metalloprotein containing heme groups whose iron atoms temporarily link to oxygen molecules (O_2) in the lungs or gills and release them throughout the body. Oxygen can easily diffuse through the red blood cell's cell membrane. Hemoglobin in the erythrocytes also carries some of the waste product carbon dioxide back from the tissues; most of the carbon dioxide is however transported as bicarbonate dissolved in the blood plasma. Myoglobin, a compound related to hemoglobin, acts to store oxygen in muscle cells.

The color of erythrocytes is due to the heme group of hemoglobin. The blood plasma alone is straw-colored, but the red blood cells change color depending on the state of the hemoglobin: when combined with oxygen

the resulting oxyhemoglobin is scarlet, and when oxygen has been released the resulting deoxyhemoglobin is darker, appearing bluish through the vessel wall and skin. Pulse oximetry takes advantage of this color change to directly measure the arterial blood oxygen saturation using colorimetric techniques.

The sequestration of oxygen carrying proteins inside specialized cells (rather than having them dissolved in body fluid) was an important step in the evolution of vertebrates; it allows for less viscous blood, higher concentrations of oxygen, and better diffusion of oxygen from the blood to the tissues. The size of erythrocytes varies widely among vertebrate species; erythrocyte width is on average about 25% larger than capillary diameter and it has been hypothesized that this improves the oxygen transfer from erythrocytes to tissues.

Erythrocytes

The diameter of a typical human erythrocyte disk is 6–8 μm, much smaller than most other human cells. A typical erythrocyte contains about 270 million hemoglobin molecules, with each carrying four heme groups.

Adult humans have roughly 2–3 × 10^{13} red blood cells at any given time (women have about 4 to 5 million erythrocytes per microliter (cubic millimeter) of blood and men about 5 to 6 million; people living at high altitudes with low oxygen tension will have more). Red blood cells are thus much more common than the other blood particles: there are about 4,000–11,000 white blood cells and about 150,000–400,000 platelets in each microliter of human blood.

In humans, hemoglobin in the red blood cells is responsible for the transport of more than 98% of the oxygen; the remaining oxygen is carried dissolved in the blood plasma.

The red blood cells of an average adult human male store collectively about 2.5 grams of iron, representing about 65% of the total iron contained in the body.

The process by which red blood cells are produced is called erythropoiesis. Erythrocytes are continuously being produced in the red bone marrow of large bones, at a rate of about 2 million per second. (In the embryo, the liver is the main site of red blood cell production.) The production can be stimulated by the hormone erythropoietin (EPO), synthesised by the kidney; this is used for doping in sports. Just before and after leaving the bone marrow, the developing cells are known as reticulocytes; these comprise about 1% of circulating red blood cells.

Erythrocytes develop from committed stem cells through reticulocytes to mature erythrocytes in about 7 days and live a total of about 120 days.

The aging erythrocyte undergoes changes in its plasma membrane, making it susceptible to recognition by phagocytes and subsequent phagocytosis in the spleen, liver and bone marrow. Much of the important breakdown products are recirculated in the body. The heme constituent of hemoglobin are broken down into Fe^{3+} and biliverdin. The biliverdin is reduced to bilirubin, which is released into the plasma and recirculated to the liver bound to albumin. The iron is released into the plasma to be recirculated by a carrier protein called transferrin. Almost all erythrocytes are

removed in this manner from the circulation before they are old enough to hemolyze. Hemolyzed hemoglobin is bound to a protein in plasma called haptoglobin which is not excreted by the kidney

Blood diseases involving the red blood cells include:

- Anemias (or anaemias) are diseases characterized by low oxygen transport capacity of the blood, because of low red cell count or some abnormality of the red blood cells or the hemoglobin.
    - Iron deficiency anemia is the most common anemia; it occurs when the dietary intake or absorption of iron is insufficient, and hemoglobin, which contains iron, cannot be formed
    - Sickle-cell disease is a genetic disease that results in abnormal hemoglobin molecules. When these release their oxygen load in the tissues, they become insoluble, leading to mis-shaped red blood cells. These sickle shaped red cells are rigid and cause blood vessel blockage, pain, strokes, and other tissue damage.
    - Thalassemia is a genetic disease that results in the production of an abnormal ratio of hemoglobin subunits.
    - Spherocytosis is a genetic disease that causes a defect in the red blood cell's cytoskeleton, causing the red blood cells to be small, sphere-shaped, and fragile instead of donut-shaped and flexible.

  - Pernicious anemia is an autoimmune disease wherein the body lacks intrinsic factor, required to absorb vitamin B12 from food. Vitamin B12 is needed for the production of hemoglobin.
  - Aplastic anemia is caused by the inability of the bone marrow to produce blood cells.
  - Pure red cell aplasia is caused by the inability of the bone marrow to produce only red blood cells.
  - Hemolysis is the general term for excessive breakdown of red blood cells. It can have several causes.

- The malaria parasite spends part of its life-cycle in red blood cells, feeds on their hemoglobin and then breaks them apart, causing fever. Both sickle-cell disease and thalassemia are more common in malaria areas, because these mutations convey some protection against the parasite.
- Polycythemias (or erythrocytoses) are diseases characterized by a surplus of red blood cells. The increased viscosity of the blood can cause a number of symptoms.
  - In polycythemia vera the increased number of red blood cells results from an abnormality in the bone marrow.
- Several microangiopathic diseases, including disseminated intravascular coagulation and thrombotic microangiopathies, present with pathognomonic (diagnostic) RBC fragments called schistocytes.

These pathologies generate fibrin strands that sever RBCs as they try to move past a thrombus.

- Hemolytic transfusion reaction is the destruction of donated red blood cells after a transfusion, mediated by host antibodies, often as a result of a blood type mismatch.

Several blood tests involve red blood cells, including the *RBC count* (the number of red blood cells per volume of blood) and the hematocrit (percentage of blood volume occupied by red blood cells). The blood type needs to be determined to prepare for a blood transfusion or an organ transplantation

5. White blood cells (WBC)

White blood cells, or leukocytes, are cells of the immune system defending the body against both infectious disease and foreign materials. Five different and diverse types of leukocytes exist, but they are all produced and derived from a multipotent cell in the bone marrow known as a hematopoietic stem cell. Leukocytes are found throughout the body, including the blood and lymphatic system.

The number of leukocytes in the blood is often an indicator of disease. There are normally between 4×10^9 and 11×10^9 white blood cells in a litre of blood, making up approximately 1% of blood in a healthy adult. In conditions such as leukemia, the number of leukocytes is higher than normal, and in leukopenia, this number is much lower. The physical properties of leukocytes, such as volume, conductivity, and granularity, may change due to activation, the presence of immature cells, or the presence of malignant leukocytes in leukemia.

The name 'White blood cell' derives from the fact that after centrifugation of a blood sample, the white cells are found in the buffy coat, a thin layer of nucleated cells between the sedimented red blood cells and the blood plasma, which is typically white in color. The scientific term *leukocyte* directly reflects this description, derived from Greek *leukos* - white, and *kytos* - cell. Blood plasma may sometimes be green if there are large amounts of neutrophils in the sample, due to the heme-containing enzyme myeloperoxidase that they produce

There are several different types of white blood cells. They all have many things in common, but are all different. One primary technique to classify them is to look for the presence of granules, which allows the differentiation of cells into the categories granulocytes and agranulocytes:

- Granulocytes (polymorphonuclear leukocytes) : leukocytes characterised by the presence of differently staining granules in their cytoplasm when viewed under light microscopy. These granules are membrane-bound enzymes which primarily act in the digestion of endocytosed particles. There are three types of granulocytes: neutrophils, basophils, and eosinophils, which are named according to their staining properties.

- Agranulocytes (mononuclear leucocytes**:** leukocytes characterized by the apparent absence of granules in their cytoplasm. Although the name implies a lack of granules these cells do contain non-specific azurophilic granules, which are lysosomes. The cells include lymphocytes, monocytes, and macrophages

6. Polymorph (granulocyte)

Granulocytes or polymorph are a category of white blood cells characterised by the presence of granules in their cytoplasm. They are also called polymorphonuclear leukocytes (PMN or PML) because of the varying shapes of the nucleus, which is usually lobed into three segments. In common parlance, the term *polymorphonuclear leukocyte* often refers specifically to neutrophil granulocytes, the most abundant of the

granulocytes. Granulocytes or PMN are released from the bone marrow by the regulatory complement proteins.

There are three types of granulocytes, distinguished by their appearance under Wright's stain:

- Neutrophil granulocytes
- Eosinophil granulocytes
- Basophil granulocytes

Their names are derived from their staining characteristics; for example, the most abundant granulocyte is the neutrophil granulocyte, which has neutrally-staining cytoplasmic granules.

Other white blood cells which are not granulocytes (‘agranulocytes’) are mainly lymphocytes and monocytes.

Granulocytopenia is an abnormally low concentration of granulocytes in the blood. This condition reduces the body's resistance to many infections. Closely-related terms include agranulocytosis (no granulocytes at all) and neutropenia (deficiency of neutrophil granulocytes). Transfusion of granulocytes would have been a solution to the problem. However, granulocytes live only ~10 hours in the circulation (for days in spleen or other tissue), which gives a very short-lasting effect. In addition, there are many complications of such procedure. A granuloma is a tumor containing granulocytes, and a ‘granulomatosis’ is a necrotizing granuloma. There is usually a granulocyte chemotactic defect in individuals who suffer from insulin dependent diabetes mellitus.

7. Lymphocyte

Lymphocyte is a type of white blood cell in the vertebrate immune system. By their appearance under the light microscope, there are two broad categories of lymphocytes, namely the large granular lymphocytes and the small lymphocytes. Functionally distinct subsets of lymphocytes correlate with their appearance. Most, but not all large granular lymphocytes are more commonly known as the natural killer cells (NK cells). The small lymphocytes are the T cells and B cells. Lymphocytes play an important and integral role in the body's defenses.

An average human body contains about 10^{12} lymphoid cells, and the lymphoid tissue as a whole represents about 2% of the total body weight. It is 20-40% of all leukocytes.

The three major types of lymphocyte are T cells, B cells and natural killer (NK) cells.

NK cells are a part of innate immune system and play a major role in defending the host from both tumours and virally infected cells. NK cells distinguish infected cells and tumours from normal and uninfected cells by recognizing alterations in levels of a surface molecule called MHC (major histocompatibility complex) class I. NK cells are activated in response to a family of cytokines called interferons. Activated NK cells release cytotoxic (cell-killing) granules which then destroy the altered cells. They were named ‘natural killer’ because of the initial notion that they do not require prior activation in order to kill cells which are missing MHC class I.

T cells and B-cells are the major cellular components of the adaptive immune response. T cells are involved in cell-mediated immunity whereas B cells are primarily responsible for humoral immunity (relating to antibodies). The function of T cells and B cells is to recognize specific 'on-self' antigens, during a process known as antigen presentation. Once they have identified an invader, the cells generate specific responses that are tailored to maximally eliminate specific pathogens or pathogen infected cells. B cells respond to pathogens by producing large quantities of antibodies which then neutralize foreign objects like bacteria and viruses. In response to pathogens some T cells, called *helper T cells* produce cytokines that direct the immune response while other T cells, called *cytotoxic T cells*, produce toxic granules that induce the death of pathogen infected cells. Following activation, B cells and T cells leave a lasting legacy of the antigens they have encountered, in the form of *memory cell*s. Throughout the lifetime of an animal these memory cells will "remember" each specific pathogen encountered, and are able to mount a strong response if the pathogen is detected again.

Mammalian stem cells differentiate into several kinds of blood cell within the bone marrow. This process is called haematopoiesis. All lymphocytes originate, during this process, from a common lymphoid progenitor before differentiating into their distinct lymphocyte types. The differentiation of lymphocytes follows various pathways in a hierarchical fashion as well as in a more plastic fashion. The formation of lymphocytes is known as lymphopoiesis. B cells migrate to the spleen and mature into B lymphocytes, while T cells migrate to and mature in a distinct organ, called the thymus. Following maturation, the lymphocytes enter the circulation and

peripheral lymphoid organs (e.g the spleen and lymph nodes) where they survey for invading pathogens and/or tumour cells.

The lymphocytes involved in adaptive immunity (i.e. B and T cells) differentiate further after exposure to an antigen; they form effector and memory lymphocytes. Effector lymphocytes function to eliminate the antigen, either by releasing antibodies (in the case of B cells), cytotoxic granules (cytotoxic T cells) or by signaling to other cells of the immune system (helper T cells). Memory cells remain in the peripheral tissues and circulation for an extended time ready to respond to the same antigen upon future exposure. They live weeks to several years, which is very long compared to other leukocytes.

A lymphocyte count is usually part of a peripheral complete blood cell count and is expressed as percentage of lymphocytes to total white blood cells counted. An increase in lymphocytes is usually a sign of a viral infection (in some rare cases, leukemias are found through an abnormally raised lymphocyte count in an otherwise normal person). A general increase in the number of lymphocytes is known as lymphocytosis whereas a decrease is lymphocytopenia.

A decrease in lymphocytes occurs when the human immunodeficiency virus (HIV) hijacks and destroys T cells (specifically, the $CD4^+$ subgroup of T lymphocytes). Without the key defense that these T cells provide, the body becomes susceptible to opportunistic infections that otherwise would not affect healthy people. The extent of HIV progression is typically determined by measuring the percentage of $CD4^+$ T cells in the

patient's blood. The effects of other viruses or lymphocyte disorders can also often be estimated by counting the numbers of lymphocytes present in the blood.

8. Eosinophils

Eosinophil granulocytes, usually called *eosinophils* are white blood cells that are one of the immune system components responsible for combating infection and parasites in vertebrates. They also control mechanisms associated with allergy and asthma. They are granulocytes that develop during hematopoiesis in the bone marrow before migrating into blood.

In normal individuals eosinophils make up about 1 to 6% of white blood cells, and are about 12 to 17 micrometers in size. They are found in the medulla and the junction between the cortex and medulla of the thymus, and, in the lower gastrointestinal tract, ovary, uterus, spleen, and lymph nodes, but not in the lung, skin, esophagus, or some other internal organs under normal conditions. The presence of eosinophils in these latter organs is associated with disease. Eosinophils persist in the circulation for 8 to 12 hours, and can survive in tissue for an additional 8 to 12 days in the absence of stimulation.

Eosinophils develop and mature in bone marrow. Eosinophils produce and store many secondary granule proteins prior to their exit from the bone marrow. After maturation, eosinophils circulate in blood and migrate to inflammatory sites in tissues, or to sites of helminth infection in response to chemokines. At these infectious sites, eosinophils are activated

by Type 2 cytokines released from a specific subset of helper T cells (T_h2); IL-5, GM-CSF, and IL-3 are important for eosinophil activation as well as maturation.

In addition, eosinophils play a role in fighting viral infections, which is evident from the abundance of RNA they contain within their granules, and in fibrin removal during inflammation. Eosinophils along with basophils and mast cells, are important mediators of allergic responses and asthma pathogenesis and are associated with disease severity. They also fight helminth (worm) colonization and may be slightly elevated in the presence of certain parasites. Eosinophils are also involved in many other biological processes, including post pubertal mammary gland development, estrus cycling, allograft rejection and neoplasia. They have also recently been implicated in antigen presentation to T cells.

An increase in eosinophils, i.e., the presence of more than 500 eosinophils/microlitre of blood is called an eosinophilia, and is typically seen in people with a parasitic infestation of the intestines, a collagen vascular disease (such as rheumatoid arthritis), malignant diseases such as Hodgkin's Disease, extensive skin diseases (such as ex foliative dermatitis), Addison's Disease, in the squamous epithelium of the esophagus in the case of reflux esophagitis, Eosinophilic esophagitis, and with the use of certain drugs such as penicillin.

Eosinopenia is a decrease in eosinophil number, which occurs when glucocorticoids are administered or when Cushing's disease is present. Dr. Harvey Cushing, the man who discovered the disease, identified

eosinopenia as one of the primary indicators in a patient suffering that disease. Over the years, with the increase in glucocorticoid therapy and the growing stresses in our society (another cause of a suppressed count), Eosinopenia has lost favor as a Cushing's diagnostic tool. That fact causes many people suffering Cushing's to often go undiagnosed for years until their symptoms become more severe.

9. Erythrocytic sedimentation rate (ESR)

The erythrocytic sedimentation rate (ESR), also called a sedimentation rate, sed rate, or Biernacki Reaction, is the rate at which red blood cells precipitate in a period of 1 hour. It is a common haematology test which is a non-specific measure of inflammation. To perform the test, anticoagulated blood is placed in an upright tube, known as a Westergren tube and the rate at which the red blood cells fall is measured and reported in mm/h.

The ESR is governed by the balance between pro-sedimentation factors, mainly fibrinogen, and those factors resisting sedimentation, namely the negative charge of the erythrocytes (zeta potential). When an inflammatory process is present, the high proportion of fibrinogen in the blood causes red blood cells to stick to each other. The red cells form stacks called 'rouleaux' which settle faster. Rouleaux formation can also occur in association with some lymphoproliferative disorders in which one or more immunoglobulins are secreted in high amounts. Rouleaux formation can, however, be a normal physiological finding in horses, cats and pigs.

Although it is frequently ordered, the erythrocyte sedimentation rate (ESR) is not a useful screening test. It is useful for diagnosing diseases, such as multiple myeloma, temporal arteritis, polymyalgia rheumatica, various auto-immune diseases, systemic lupus erythematosus, rheumatoid arthritis, and chronic kidney diseases. In many of these cases, the ESR may exceed 100 mm/hour.

It is commonly used for a differential diagnosis for Kawasaki's disease and it may be increased in some chronic infective conditions like tuberculosis and infective endocarditis. It is a component of the PDCAI, an index for assessment of severity of inflammatory bowel disease in children.

The clinical usefulness of erythrocyte sedimentation rate (ESR) is limited to monitoring the response to therapy in certain inflammatory diseases such as temporal arteritis, polymyalgia rheumatica and rheumatoid arthritis. It can also be used as a crude measure of response in Hodgkin's lymphoma. Additionally, ESR levels are used to define one of the several possible adverse prognostic factors in the staging of Hodgkin's lymphoma.

The use of the ESR as a screening test in asymptomatic persons is limited by its low sensitivity and specificity. When there is a moderate suspicion of disease, the ESR may have some value as a ‘sickness index.’

Westergren's original normal values (men 3mm and women 7mm[made no allowance for a person's age and in 1967 it was confirmed that ESR values tend to rise with age and to be generally higher in women. Values are increased in states of anemia, and in black populations.

10. Blood Sugar

Physiologically, the term means only glucose in the blood. Other sugars are present. sometimes in more than trace amounts but only glucose serves as a controlling signal for metabolic regulation. Other sugars are to some extent, inert.. Glucose, transported via the blood stream from the intestines or liver to body cells, is the primary source of energy for the body's cells.

Blood sugar concentration, or glucose level, is tightly regulated in the human body. The total amount of glucose in circulating blood is therefore about 3.3 to 7g (assuming an ordinary adult blood volume of 5 liters, plausible for an average adult male).Glucose levels rise after meals for an hour or two by a few grams and are usually lowest in the morning, before the first meal of the day.

Failure to maintain blood glucose in the normal range leads to conditions of persistently high (hyperglycemia) or low (hypoglycemia) blood sugar. Diabetes mellitus, characterised by persistent hyperglycemia from any of several causes, is the most prominent disease related to failure of blood sugar regulation.

Despite the intervals between meals or the occasional consumption of meals with a substantial carbohydrate load, human blood glucose level normally remain within a remarkably narrow range. In most humans this varies from about 80mg/ldl to perhaps 110mg/dl (3.9 to 6.0 mmol/litre) except shortly after eating when the blood glucose level rises temporarily (up to may be 140mg/dl or a bit more in non-diabetics)

Although it is called blood sugar, other simple sugars aside from glucose are found in the blood ,such as fructose and galactose but only glucose levels are used as metabolic regulation signals (via insulin and glucagone).

11. Blood Urea

Urea is, in essence, a waste product. It is found and retracted from urine. Organisms synthesize urea from ammonia raises pH in cells to toxic levels. Therefore, urea synthesis is necessary even though it costs energy to produce. Urea is neither acidic nor basic ,so it is a perfect vehicle for getting rid of nitrogen waste. Urea production occurs in the liver and is regulated by N-acetyl glutamate.

Urea plays a very important role in that it helps set up the countercurrent system in the nephrons. The countercurrent system in the nephron allows for reabsorption of water and critical ions. Urea is reabsorbed in the inner medullary collecting ducts of the nephrons, thus raising the osmolarity in the medullary interstitium surrounding the thin ascending limb of the Loop of Henle. The greater the osmolarity of the medullary interstitium surrounding the thin ascending Loop of Henle, the more water will be reabsorbed out of the renal tubule back into the interstitium (and thus back into the body). Some of the urea from the meduallary interstitium that helped set up the Countercurrent System will also flow back into the tubule, through urea transporter 2, into the thin ascending limb of the loop of Henle, through the collecting ducts, and eventually out of the body as a component of urine. It is dissolved in blood

(in a concentration of 2.5 to 7.5 mmol/liter) and excreted by the kidney as a component of urine. In addition, a small amount of urea is excreted (along with sodium chloride and water) in sweat.

Control of urea by antidiuretic hormone allows the body to create hyper osmotic urine (urine that has more ions in it is 'more concentrated' than that same person's blood plasma). Preventing the loss of water in this manner is important if the person's body needs to save water in order to maintain a suitable blood pressure or (more likely,) in order to maintain a suitable concentration of sodium ions in the blood plasma. Normal value of urea in human being is a range between 20 to 40%mg.

12. Albumin (Urine)

Serum albumins are important in regulating the osmotic pressure of the blood compartment. They also serve as carriers for molecules of low water solubility, including lipid soluble hormones.) Albumin is made in the liver from amino acids that have been absorbed from digested protein. Albumineria is the presence of protein in urine. It indicate a failure of kidney's filtering mechanism due to nephrotic syndrom.The normal range of albumin is 0-8mg/dl.

Descriptions of psychological variables

IAS Rating Scale

The Mathew Inertia, Activation, Stability (IAS) rating scale is a well known personality test, which is widely used in psychological researches in Kerala (see appendix I). The variables being measured by this tests are

inertia (*thamo guna*) activation (*rajo guna*) and stability (*sathwa guna*). They are the components of personality dimensions. They cut across cognitive temperament and motivational modality (Mathew, V.G., 1995). The trait descriptions are given below; as described in the test manual.

Inertia: lethargic**,** lack of energy, slow, late fear, anxious, timid, not venturing, inhibited, shy, withdrawn, weak willed, suggestible, submissive, unable to assert, refuse or argue, inability to mix with strangers, low self confidence, blind conformity, no strong emotional ties, masochistic, intropunitive, external locus of control (believing in fate and luck) no strong moral control, no definite values and collectivistic.

Activation: Overactive, uncontrolled energy, impatient, hasty, efficient in planning practical things for the future, analytical, risk taking, rash, adventurous, go-getting acquisitive, aggressive, greedy, competitive, maniacal, passionate, ego-involved assertive, dominant, *inability to be a follower, thick-skinned, proud, egoistic, values power, rebelling extra punitive sadistic, unable to remain alone, or be silent, Internal locus of control, (believing in self-effort and freedom of will) needing rigid external moral controls, having conflicts and Individualistic.*

Stability

Controlled, restful, detached action, meta motivation, can be fast or slow as the situation demands, punctual, philosophical, wise (in addition to being practically efficient) self actualizing, holistic, intuitive, taking calculated risks, balanced, mature, open, warm, even-tempered, dispassionate, self-sufficient, self-accepting, relaxed, peaceful, democratic can make a show of

anger when required, fair, tolerant, loving, unselfish, altruistic, forgiving oneself and others, enjoys aloneness or company, transcending sex, reforms group, broad minded, morale sense based on love.

Reliability

Reliabilities may be determined for each population for each type of rating. Reliabilities are in general high, particularly for reasonably educated adult raters. Vinod kumar (1995) reports split-half reliabilities of .73, .89 and .86 for the scales I, A and S respectively in a sample of 43 adult raters for self-rating.

Validity

The trait classification has a high degree of construct validity as they are based on a highly developed theory anchored on a time-tested traditional concept of personality. Meaningful mean group differences have been reported on the three scales in a variety of studies.

Development of the scale

The scale is the revision of two personality inventories: the SRT inventory and the Mathew Temperament Scale. The classical trait conceptions of *thamas*, r*ajas*, and *sathva* in the SRT Inventory and thoughtfulness, gregariousness and maladjustment (derived from factor analysis at the item level) in the Mathew Temperament Scale have been combined in the present scale to give more psychologically, meaningful, theoretically significant and practically useful trait concepts. An attempt is

made in this instrument to solve the problem of social desirability by introducing different types of rating for assessment.

Personality theory behind the IAS trait concepts

The three component of personality are mutually exclusive. Stability is not a mid- point between the two extremes of Inertia and Activation, but another dimension. Inertia and Activation are two contrasted type of inabilities (deficiencies and dependencies, while stability indicates the degree of freedom.

Inertia is inability to act; Activation is inability to rest, be alone or be at peace with oneself. Stability is to transcendence, self-sufficiency and meta-motivation and the ability to act or not act, mix with others or be alone with equal ease. Therefore the forced-choice mode of response is best to measure these three components of personality.

Modern concepts of introversion involve a mixture of Inertia and Stability and the concept of extraversion include Activation and Stability.

Interest in being alone is different from inability to mix with others. In fact, a man who can effectively mix is one the same as impulsivity. Therefore we have to differentiate between mixing as a result of freedom and compulsive mixing and we have to separate a man who finds happiness in aloneness from one who is alone because of inability to find a company. Many popular scales of introversion pool together interest in aloneness with inability to socialize and absence of impulsivity with inability to be active. Similarly many scales measuring extraversion combine habits of mixing with

inability to be alone and they confuse inability to find happiness in restful stillness with effective action.

Many popular scales measuring Stability consider stability as merely the absence of pathological symptoms like anxiety, depression and so on. The present conception views stability as stress tolerance, freedom to adjust and find happiness in different situations (alones or company) and act or not act as one chooses. Many popular scales measuring introversion-extraversion ask questions like whether you mix socially or not, whether you are active or not, without separating inabilities and dependencies from freedom and flexibility. This indiscriminate mixing and clubbing together of theoretically different things at the level of item writing and basing theory on superficial observed similarities without separating causes has led introversion and extraversion appearing as the same dimension and sociability and impulsively appearing as two different factors. On the other hand, when items are written separating inabilities and dependencies (to mix or be alone as well as rest or act) from freedom of flexibility, the resulting position is tripolar. Mathew (1995) says that most personality inventories treat introversion and extraversion as value free; here Inertia and Activation are treated as undesirable, Stability being the desirable position.

Administration and scoring

The **IAS** personality scale was administered individually and the instructions were explained to them. The test is a forced choice type in which for every item the score of three should be distributed for the three statements in each items. The percentile scores are found for each subscale

according the table of norms given in the manuals (Mathew, V.G., 1995). Each items contains three statements measuring Inertia Activation and Stability.

Procedure for collection of data

In order to achieve the first objective of the study that is to find out the similarities and the differences in the etiological concepts described in various systems of medicine, a detailed survey of the relevant literature was made (presented in chapter II).

The following steps were taken in the collection of data at various stages of the research.

- In order to find the prognostic status of various systems of medicine the self reports of patients who came for the holistic camp were used.
- In order to arrive at an effective cure method, the holistic health camp procedure was followed.
- The investigator had casual interviews with the practicing doctors (not less than ten doctors in each system) for collecting their opinions about the etiology of asthma.
- A thorough survey of literature was made along with unstructured interviews with practicing doctors with various systems regarding their therapy procedures of asthma. Also information were collected from patients in hospitals and other social situation.

Holistic cure camp procedure

Data were collected from holistic cure camps held at Calicut, Kannur, Malappuram, Ernakulam, Thrissur and Quilon districts. Patients from other districts have also participated in the camps. Eight such camps were held.

Media news announcement were done regarding the camps. Details regarding the camps were printed in a notice and the same also was circulated among the general public (See appendix II).

The notice clearly indicated the therapy procedure,its rationale, probable outcome and the expenses to be shared by the participants. The camps were held free of cost. However, the boarding lodging expenses of the patient as well as the accompanying person were to be met by themselves. Provision for fully or partially free participation of the camp was provided using donation from individuals and organizations.

The camp was initially for a period of seven days. Patients were asked to follow the same procedure for forty days including the camp period. Follow up meetings for the campers were held after twenty days and forty days. The camp started in an evening according to the news announcement. An introductory lecture regarding the rationale of the therapeutic procedure was given. The most important aspects of the camp was a change in to uncooked natural diet (yogic diet) and two sessions of yogasana training in the morning and evening. The camps were held in such a way that participants experience a relaxed and friendly atmosphere without following strict regimentation or rules. Effort was made to increase the group cohesiveness in the camp. They were allowed to listen to the talks lectures, even in lying position. (if they are very tired) or sitting leaning their back on walls or in *sughasana* (sitting with legs stretched forward leaning back supporting hand at back) The atmosphere of the camps were made highly peaceful. However, self induced discipline was encouraged. Group decisions

on the conductance of the camps were also encouraged. The rationale behind the yogic diet and yogasana was explained in the first lecture itself.

Raw diet is believed to be highly of *satwik* quality. It is possible that the digestive enzymes of raw diet and cooked food may be different. The raw diet bring in us a humeral balance, it eliminates toxic substances from the body and rectifies problems of internal organs. A balanced and stress-free psychological state is the most outstanding effect of the raw food. Such an effect was reported by almost all participants in the camp. The investigator also had first hand experience of raw eating as the investigator also was staying along with the subjects in the camp. It is a very important aspect to be noted that eating only raw food will bring this change. When mixing with cooked food, these changes will be considerably less and slow.

The practice of yogasana and meditation are regarded as highly useful psychotherapeutic techniques by holistic health researches. The yogasana and meditation bring down all metabolic activities and gives rest and vital power to the brain and associated nervous system.

There is experimental evidence that yogasana and meditation bring down the thought rate (the state of *dhyana*), balances the humors and eliminates toxic substances from the body, which are conducive to cure. A total equilibrium is brought in by these techniques.

Collection of personal information and other data

The investigator was also participating in the camp and the personal information was gathered directly from the patients on the first day. Their

physiological measures were taken during the morning hours of the second day of the camp. Blood / urine samples were collected and subjected for clinical lab investigations. The proforma used for recording such data is appended (Appendix III). The psychological test was administered in the second day subsequently after the clinical lab tests. All such investigation were repeated except personality test on the forty first day morning.

Diet followed in the camps

Subjects were provided with raw food throughout the therapy package period. Effort was taken to avoid commercial food as far possible. Commercially available foods are often low in nutritional value as they are artificially produced. Chemical fertilizers and pesticides pollute such foods, which is highly hazardous to health. So naturally cultivated fruits, vegetables and other raw foods, especially the seasonally available fruits and nuts such as mango, jack fruits etc., fruits which are available in all season such as coconut, banana, dates, ground nuts etc. were preferred, Fruits available in all seasons contain more nutrients.

The personally preferred natural food of each subject was given priority as the personal liking is very much related to bodily requirements especially in the case of natural uncooked diet.

Holistic Health classes

Every day two or three classes were given. The classes were taken by holistic health experts and psychologists. The content of the classes were on natural health philosophy, natural diet, disease symptoms, etiology,

nutritional cure (*pancha bhoothas*), yoga, health psychology, natural farming and simple living.

Psychological counseling

The subjects were given individual and group counseling. The emotional problems and adjustment problems were relieved in the individual and group counseling. Efforts were made to alleviate their problems in personal discussion and conversations during the group activities of the camp.

Artistic expressions

Artistic expressions were mainly intended for relaxing and bringing in a meditative atmosphere. Devotional types of soft music and light and semi classical film songs were used by expert singers. Group singing also was held. The film songs, which are rich in literary and musical qualities comprehensive, to everybody were preferred. Such songs were used for emotional catharsis. Participants were encouraged to perform individually and in group, folk songs, folk dance, skits etc. without compelling them to participate. Most of the participants voluntarily took part.

Yoga and meditation

Every morning and evening during the camp period a basic course in yogasana training was given to patients from the second day. The course contained 23 *yogasana* postures including *savasana* and meditation based on empirical and experiential insights derived from various *yogasana* courses held in Universty of Calicut. The yoga course was derived after discussing about the course content with yoga expert in International Yoga centers in India. The same was presented in a national seminar of clinical Psychologists to ascertain its clinical value (Baby, J.2004). The procedure and course content of the *yogasana* programme is appended (Appendix IV).

The salient features of yogasana course were that it was more therapeutic in its purpose. Participants were advised to do an *asanam* within their capability. Struggling for a final posture was discouraged all the time, only what the patient could do was permitted. Relaxing in *savasana* was provided in between all the postures. And a long *savasana* for five minutes was given at the end of each session. Specific instruction was not given for breathing except a general instruction of deep steady and slow breathing. Exercises were not mixed with *yogasanas*, as exercises are more '*rajasic'* in character. Also the system followed here in *yogasana* training does not approve of mixing *yogasana* and exercises.

A Buddhish type of meditation technique of observing breath was instructed throughout the sessions. That is, watching or paying attention to the air entering the lungs and the air going out of the lungs. This can result into a no mind state (*chitta vritti nirodham*) according to Pathanjaly the

compiler of *Astanga Yoga Sutra*. Another feature of the meditation- training course was that the participants were instructed to observe silence through out the session as a prelude to bring in inner silence and self- control..

All the above programmes were held in a very cooperative and participatory manner. No regimentation was enforced in the camp. The participants were allowed to associate with the routine organizational activities of the camp.

The campers were advised to go home and practice the diet and yogasana at home for a total period of 40 days .A follow up after 20 days was made to evaluate their developments and clear doubts. Campers gathered together on the 41st day and were advised to partially begin spiceless and saltless cooked food. The methodology to gradually change over to cooked food was elaborated to them.

Statistical analysis

The study, predominantly qualitative in nature as it aimed at arriving at an efficient cure procedure for asthma. The statistical technique selected was based on the objectives set forth and hypotheses formulated for the study. The first part of the study was theoretical analysis of the etiology and therapy prevailing in various systems of medicine. The statistical technique used in the present investigation to facilitate the analysis and interpretation of data is the test of significant difference between the mean scores of the variables in pre intervention and post intervention.

It is the ratio of statistics to its standard error. The statistical significance of *t* is dependent up on its size and the number of degrees of freedom, or the number of observations minus the number of independent restrictions on the sample. A common use of *t* is in the determination of the significance of differences between two means. The *t* test is then stated in terms of the probability, or ‘p’ value, with which it may be expected that additional samples of data would yield by chance differences just as large as those obtained. For differences to be significantly greater than ‘p’ values of .01 to .05 are conventionally accepted as highly significant (Garrett 1969).

CHAPTER IV

RESULTS AND DISCUSSIONS

RESULTS AND DISCUSSIONS

The results are presented in the sequence of the objectives of this study. The first hypotheses is formulated to achieve this objective.

Objective: 1

To asses the prognostic status of asthma in various systems of Medicine

The therapy outcome of various systems of medicine they had undergone, reported by asthma patients (n= 64) is presented in table 4.1. Out of the 64 patients, 60 of them have undergone allopathic treatment, 45 *ayurveda* 28 homeopathy 7 naturopathy and 8 of the patients had undergone other therapy like *sidha* and *unani.* It is to be noted that some of the patients have undergone more than one therapy. None of the patient had reported a cure or complete recovery from any of the therapies .And also none of them had reported an increase in the symptoms after therapy.

Out of the 60 patients who resorted to allopathic treatment 30 patients reported a partial recovery and 25 of them reported a slight recovery from symptoms. Only 5 patients reported no change in their symptoms.

The allopathic drugs are well known for their efficiency in suppressing asthmatic symptoms and in this sample maximum number or of the subjects have adopted this therapy (60/64), but a complete cure was not reported by any of the patient.

Table 4.1

Therapy outcome of various systems of Medicine reported by asthma patients (n=64)

System of Medicine	Duration of therapy (Years)	Number of cases reported recovered / not recovered				
		Fully recovered	Partially recovered	Slight recovery	No recovery	Symptom Increased
Allopathic treatment (n = 60)	1	--	1	1	2	--
	3	--	5	2	0	--
	5	--	3	6	0	--
	10	--	6	8	1	--
	15	--	5	3	1	--
	Above 15	--	10	5	1	--
Total		**--**	**30**	**25**	**5**	**--**
Ayurvedic treatment (n = 46)	1	--	8	6	0	--
	3	--	5	9	2	--
	5	--	6	3	1	--
	10	--	2	1	0	--
	15	--	3	--	--	--
Total		**--**	**24**	**19**	**3**	**--**
Homoeopathic treatment (n=28)	1	--	5	8	--	--
	3	--	2	7	--	--
	5	--	4	--	--	--
	10	--	2	--	--	--
Total		**--**	**13**	**15**	**--**	**--**
Other therapies (n=6)	1	--	--	6	--	--
Total		**--**	**--**	**6**	**--**	**--**
Naturopathic treatment (n=7)	1	--	--	4	--	--
	3	--	--	3	--	--
Total		**--**	**--**	**7**	**--**	**--**

Out of the 46 patients who resorted to *ayurvdic* remedy for asthma 24 of them reported a partial recovery and 19 of them have slight recovery, and 3 of the patient reported no recovery.

Next to Modern Medicine, *ayurveda* is more popular in Kerala, that is why the second position as per the total number of the patients resorted to therapy is from *ayurveda*

28 patients resorted to homoeopathy, out of which 13 of them reported partial recovery and 15 of them reported slight recovery. Only 7 patients resorted to naturopathic treatment reported slight recovery. 4 of them had continued the therapy for one year and 3 of them continued for 3 years. 6 patients who resorted to other therapies like *unani*, *sidha* and fish medicine reported only slight improvement and they have continued the therapy for one year or less.

From the above survey it can be clearly concluded that a complete recovery from asthma is not found in any system of Medicine. All the systems seem to control the severity of the symptom through suppressive measures using chemical or organic drugs and diet control in the case of Naturopathy and Ayurveda and at times Homoeopathy also.

A genuine cure is not found in any of the systems, therefore the prognostic status of all the systems are very poor. So the first hypothesis is verified.

Objective: 2

To arrive at an effective cure method of asthma by proving the efficacy of therapy package

The hypothesis number 2 to 13 are formulated with this objective of arriving at an efficient cure method and therapy package for asthma. The 12 physiological variables studied here are fundamental clinical diagnostic test variables. The purpose was to find out whether the patients were suffering from any other diseases or not. These variables also ascertained the efficacy of the therapy procedure by showing the normal healthy status of such variables. The clinical lab test results are presented in tables and histograms.

Body weight

The male subjects are found to have highly significant change of reduction in their mean body weight after the therapy intervention (table 4.2).

Table.4.2

Significance of difference between the mean scores obtained in body weight (in kg) before intervention and after intervention by males

Paired sample statistics	N	Mean	SD	't' value
Before intervention	38	48.671	11.81436	8.247**
After intervention	38	45.897	10.91067	

** Significant at 0.01 level

The same highly significant reduction in body weight observed in females also (table 4.3).

Table.4.3

Significance of difference between the mean scores obtained in body weight in kg before intervention and after intervention by females

Paired sample statistics	N	Mean	SD	't' value
Before intervention	38	47.0192	10.96949	11.388**
After intervention	38	44.577	10.45593	

** Significant at 0.01 level

The reduction is found to be 3kg in both the groups, which may be due to the elimination of toxious substances from the body. Such a phenomena are generally observed in raw food diet experiments. (Ashraf, 2008; Baby Shary, 2005; Benny Varghese, 2006).

Asthma patients are generally found less in body weight probably due to emotional factors, and low rate of food consumption and related metabolic problems. The reduction in body weight in raw food diet is only a temporary phenomena. Here the reduction in body weight is in no way pathological and in holistic health standards are different from that of cooked food standard.

So the second hypothesis is verified.

Blood pressure:

A significant reduction is observed in diastolic blood pressure of male subjects (pre intervention mean 81 mm Hg and after intervention mean 75.9 mm Hg).

Table 4.4

Significance of difference between the mean scores obtained in blood pressure (diastolic) in mm Hg before intervention and after intervention by males

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	38	81.0526	12.90076	2.625*
After intervention	38	75.9211	6.86307	

* Significant at 0.05 level

The mean diastolic pressure was in the normal range and the reduction in diastolic pressure was lower to the normal range. This is generally observed in raw food practices (yogic food) and *yogasana* training. A general reduction in all metabolic activities is generally observed in holistic health practices which is conducive to better health and long life. It is probable that the BP standard for raw food may be different from that for the cooked food. In the case of women subjects the same phenomena is observed. The mean diastolic pressure was reduced to 74 mm Hg from the pre intervention mean 85 mm Hg.

The same tendency of reduction is observed in the mean systolic pressure of male subjects.(before intervention mean 120.5 mm Hg and after

intervention mean 115.5 mm Hg) and in female subjects (pre intervention mean 124.4 mm Hg and after intervention mean 112.1 mm Hg). All the reduction in BP are significant and the mean values are towards normal range showing improvement in health.

So, the third hypothesis is verified.

Table 4.5

Significance of difference between the mean scores obtained in blood pressure (diastolic) in mm Hg before intervention and after intervention by females

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	26	85.3846	11.39501	5.488**
After intervention	26	74.0385	7.48588	

** Significant at 0.01 level

Table 4.6

Significance of difference between the mean scores obtained in blood pressure (systolic) in mm Hg before intervention and after intervention by males

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	38	122.5000	22.26226	2.243*
After intervention	38	115.2632	6.25444	

* Significant at 0.05 level

Table 4.7

Significance of difference between the mean scores obtained in blood pressure (systolic) in mm Hg before intervention and after intervention by females

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	26	125.4615	22.59952	3.767**
After intervention	26	112.1154	5.68737	

** Significant at 0.01 level

Hemoglobin

The mean hemoglobin level is found significantly reduced in the case of male (before intervention mean 13mg/ and after intervention mean 12mg/).

Table 4.8

Significance of difference between the mean scores obtained in hemoglobin (gm) before intervention and after intervention by males

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	38	13.0763	1.48241	2.761**
After intervention	38	12.3132	.73711	

** Significant at 0.01 level

A significant increase is observed in female subjects (pre intervention mean 11 and after intervention mean 12). In the case of male asthma patients the mean hemoglobin level is slightly below normal range in pre intervention and after intervention. The normal for male is 13.5 to 18 mg.The reduction in hemoglobin in this experiment is opposite to usual findings. However, the low hemoglobin range is not pathologically low. The reduction in hemoglobin after raw food practice is to be studied elaborately with more control groups. In the case of female subjects a significant increase is observed in hemoglobin level. (before intervention mean 11 after intervention mean 12.16) the female subjects came to normal range. Their hemoglobin count were slightly below normal range, Hemoglobin is the ion containing oxygen transport metalloprotein in the red blood cells The dry content of the red cells are made up of 97% of the protein. Hemoglobin transport oxygen from the lungs to the rest of the body. So, a variation in the hemoglobin content is an important aspect in the asthma research. The reduced haemoglobin percent of asthma patients is due to their low intake of oxygen as a result of breath constriction. The low haemoglobin level of the male patients may be due to a healing crisis (a tendency of increase in symptoms before a cure).

So the forth hypothesis is not verified in the case of male subjects and verified in the case of female subjects.

Table 4.9

Significance of difference between the mean scores obtained in hemoglobin (gm) before intervention and after intervention by females

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	26	11.0692	1.95443	2.443*
After intervention	26	12.1692	.67336	

* Significant at 0.05 level

Red blood corpuscles (RBC)

The RBCs are the most common types of blood cells important in delivering oxygen to body tissue through blood. The cells are filled with hemoglobin, a biomolecule that can bind to oxygen. A significant reduction was observed in RBC in the case of male (pre intervention mean 4.185 mm^3 and after intervention mean 4.18 mm^3).

Table 4.10

Significance of difference between the mean scores obtained in RBC (in mm^3) before intervention and after intervention by males

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	38	4.8487	.80245	7.456**
After intervention	38	4.1842	.73578	

** Significant at 0.01 level

The same phenomenon of reduction in RBC was observed in female subjects also.(pre intervention mean 4.37 mm^3 and after intervention mean 3.81 mm^3). Though in both the groups significance is observed in mean, scores are very close to the normal range. The deficiency and excess of RBC are pathological. Since raw food is bringing a drastic change in body chemistry , the norm based on cooked food may not be appropriate to make any clinical inferences.

So, the fifth hypothesis is accepted as the mean scores are within the normal range.

Table 4.11

Significance of difference between the mean scores obtained in RBC (in mm^3) before intervention and after intervention by females

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	26	4.3719	.77922	4.898**
After intervention	26	3.8115	.69933	

** Significant at 0.01 level

White blood corpuscles (WBC)

No significant change was observed in the mean WBC of male and female subjects. The increase or decrease of WBC is often attributed to pathology. Here in this case both the male and female groups could maintain

the WBC level constantly within the normal range even after the 40 days of raw diet.

So, the sixth hypothesis is verified.

Table.4.12

Significance of difference between the mean scores obtained in WBC (in mm^3) before intervention and after intervention by males

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	38	7692.1053	1220.24180	1.917
After intervention	38	7478	1299.56498	

Table 4.13

Significance of difference between the mean scores obtained in WBC (in mm^3) before intervention and after intervention by females

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	26	7988.4615	1380.23967	1.117
After intervention	26	7615.3846	1356.15406	

Polymorph

The percentage of polymorph is significantly reduced in the case of male subjects.(pre intervention mean 59.1% and after intervention mean 55.15%). In the case of female subjects no significant difference was observed after the therapy intervention (pre intervention mean 61.50% and after intervention mean 59.03%). All the means are within the normal range. The increase in polymorph is a sign of an infection situation and the reduction in polymorph within the normal range is a sign of wellness.

So, the seventh hypothesis is proved.

Table 4.14

Significance of difference between the mean percentage scores of obtained in polymorph before intervention and after intervention by males

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	38	59.1053	10.30820	2.777**
After intervention	38	55.1316	9.49302	

** Significant at 0.01 level

Table 4.15

Significance of difference between the mean percentage scores of polymorph before intervention and after intervention by females

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	26	61.5000	6.96994	1.535
After intervention	26	59.0385	8.75662	

Lymphocytes

No significant difference was observed in the percentage of lymphocytes in male subjects (before intervention mean 39.2 and after intervention mean 40.8) and in female subjects (before intervention mean 39.03 and after intervention 38.96) The mean scores of lymphocytes in male subjects and female subjects are within the normal range, that is between 20 and 40%.The constancy of lymphocytes within the normal range during the intervention is a sign of well being.

So, the eight hypothesis is verified.

Table 4.16

Significance of difference between the mean scores obtained in lymphocytes percentage before intervention and after intervention by males

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	38	39.2105	9.60337	-1.119
After intervention	38	40.8158	8.01639	

Table.4.17

Significance of difference between the mean scores obtained in lymphocytes percentage before intervention and after intervention by females

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	26	36.3077	6.94993	1.602
After intervention	26	38.6923	8.48419	

Eosinophils

A significant reduction in the percentage of eosinophil observed in the case of male (pre intervention mean 5 and after intervention mean 3.34).

Table 4.18

Significance of difference between the mean percentage of eosinophils before intervention and after intervention by males

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	38	5.0000	2.78994	2.439*
After intervention	38	3.3447	1.75449	

* Significant at 0.05 level

The same reduction is observed in the percentage of eosinophils among the female also(before intervention mean 5.57and after intervention mean 3.57) All the means are within the normal range that is 2 to 6 % indicating a state of improved wellness after the therapy intervention. Similar results are represented by Sathyaprabha (2001).

Table 4.19

Significance of difference between the mean percentage of eosinophils before intervention and after intervention by females

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	26	5.5769	4.15859	3.103**
After intervention	26	3.5769	1.92194	

** Significant at 0.01 level

Eosinophils are white blood cells that one of the immune system component responsible for compacting infection and parasites. They secrete chemical mediators that can cause bronchoconstriction in asthma. .Eosinophil play major role in allergic asthma. Eosinophils are granulocytes that develop during hematopoises in the born marrow before migrating into the blood. The reduction in eosinophils and its maintenance within the normal range during the period of therapy intervention is a sign of improved health.

So, the ninth hypothesis is verified.

Erythrocyte sedimentation rate (ESR)

The ESR or the erythrocyte sedimentation rate is the rate at which red blood cells precipitate at one hour. A significant reduction in ESR observed in the case of male subjects (pre intervention mean 21.26 and after intervention mean 15.42).

Table 4.20

Significance of difference between the mean scores obtained in ESR before intervention and after intervention by males

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	38	21.2639	19.04289	2.306*
After intervention	38	15.4211	8.500002	

* Significant at 0.05 level

The same tendency of reduced ESR is also observed in females but not significant.(before intervention mean 15.11 and after intervention mean 12.95)

The ESR scores of the male subjects were not within the normal range, but it was reduced towards normal range after the therapy intervention. In the case of females significant change was not observed before and after the therapy and it remained within the normal range. So, the tenth hypothesis is verified.

Table 4.21

Significance of difference between the mean scores obtained in ESR before intervention and after intervention by females

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	26	15.1154	13.86312	.911
After intervention	26	12.9538	7.68865	

Blood sugar

A one percentage level significant reduction is observed in blood sugar level of the male patients after the therapy intervention (before intervention mean 95.29mg after intervention mean 85.74 mg).

Table 4.22

Significance of difference between the mean scores obtained in blood sugar (in mg) before intervention and after intervention by males

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	38	95.2895	18.39934	3.551**
After intervention	38	85.7368	17.69667	

** Significant at 0.01 level

The same significant reduction is observed in female subjects also (before intervention mean 93.88 mg and after intervention mean 82.50 mg). All the subjects were within the normal level before and after the therapy intervention The reduction in sugar level within the normal range is always a sign of health and it is to be noted that this reduction has taken place after resorting to raw food including sweet fruits during the period of intervention. This observation is confirmed by Ashraf .C. (2008) He gives evidence that raw food including sweet fruits is the best way to rejuvenate the partially reduced beta ells in the pancreas.

This finding confirm the eleventh hypothesis.

Table 4.23

Significance of difference between the mean scores obtained in blood sugar (in mg) before intervention and after intervention by females

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	26	93.8846	20.22934	2.645**
After intervention	26	82.5000	17.09093	

** Significant at 0.01 level

Blood Urea

Statistically significant reduction is observed in the blood urea of male subjects (pre intervention mean 22.46mgs and after intervention 19.46 mgs). See table 4.24.

Table 4.24

Significance of difference between the mean scores in mgs obtained in blood urea before intervention and after intervention by males

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	38	22.4632	4.21608	4.155**
After intervention	38	19.4579	2.72195	

** Significant at 0.01 level

Significant reduction is also observed in the case of female patients (pre intervention mean 26.62mgs and after intervention mean 20.20mgs) All the mean scores of male and female subjects before and after the therapy intervention are within the normal range, that is15 to 35mgs (see table 4.25). The significant reduction and remaining in normal level of urea is a sign of improved health after the therapy intervention.

Thus the twelfth hypothesis is verified.

Table 4.25

Significance of difference between the mean scores obtained in blood urea before intervention and after intervention by females

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	26	23.6192	4.40018	4.573**
After intervention	26	20.2038	4.48825	

** Significant at 0.01 level

Blood urea is a nitrogen based endproduct. The kidney is eliminating this product through urine. So, the functioning of the kidney can be assessed through the estimate of urea. When the person is suffering from some illness, the protein metabolism will be disturbed and in such a situation urea will be increased.

Albumin

A significant amount of reduction in albumin content in urine is found in male subject after the therapy intervention (before intervention mean 1.34 mg/dl and after intervention mean 1.05 mg/dl).

Table 4.26

Significance of difference between the mean scores obtained in Albumin (Urine) before intervention and after intervention by males

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	38	1.3421	.48078	3.883**
After intervention	38	1.0526	.22629	

** Significant at 0.01 level

Table 4.27

Significance of difference between the mean scores obtained in albumin (urine) before intervention and after intervention by females

Paired sample statistics	**N**	Mean	SD	't' value
Before intervention	26	1.2692	.45234	1.995*
After intervention	26	1.0769	.27175	

* Significant at 0.05 level

Similar result is observed in female subject also (before intervention mean 1.27mg/dl and after intervention mean 1.08 mg/dl). The albumin rate

in urine was within normal level before and after the therapy intervention in male and female subjects. A significant reduction in albumin (urine)is an indication of the increased health status after the therapy intervention. The normal range of albumin (urine) is 0 to 8mg/dl.The abnormal range is always indication of problems of lever, malnutrition, malignancy etc.

The 12th hypothesis is verified.

All the 13 physiological variables studied proved the hypotheses formulated except in the case of hemoglobin in male subjects. These results clearly confirm that the therapy intervention is highly effective in maintaining the physiological variable within the normal range which is conducive to health. Studies on the effect of raw food on such physiological variable are almost nil. The standard fixed by the conventional medical system cannot be fully considered in this matter, because the body chemistry is likely to be changed dramatically when the subjects are completely on raw food.

The physiological variable results are clear evidences that the therapy packages is efficient in curing asthma. The most important factor led to this cure was certainly the diet - that is fully on raw diet without mixing of cooked items. The holistic therapists all over the world are of the opinion that the nutritional variables are very much ignored in psychological and medical researches. Especially the nutritional variables of only on raw food is seldom considered in any medical/psychological researches. The present research is a new venture in this area.

The next important variable contributed to the high rate of cure is yogasana. The holistic therapy experts in the camps had reported that those

who were not motivated to do yogasanas had slow rate of cure - and such an aspect is observed generally in holistic camps. The highly happy and relaxed atmosphere of the camp must have definitely contributed to the high rate of cure (table 4.29).

Objective 3.

To find out the etiological concepts described in various systems of medicine in relation to the present therapy intervention.

The summary of etiology, philosophy and history of major systems of medicine and their therapy practices and prognosis are given in table 4.28.

An overall review of the etiological foundation of major medical systems reveals that the origin and evolution of most of the systems are vague. But it is clear that there are many similarities in their etiological foundation. For example, the concept of bodily humor balance theories are envisaged in almost all systems of medicine. The effect of nutrition is also accepted by all such systems. It seams that the ancient knowledge on health was seen spread all over the world.

Table 4.28

Summary of Etiology, Philosophy and History of Major Systems of Medicine and their Therapy Practices

System of Medicine	Etiology, Philosophy and History	Therapy Methods for Asthma	Prognosis for asthma
Ayurveda	Based on oldest scriptures of India. Prehistoric and evolved through three to four millenniums. *Panchabhootha* theory states the body and food are composed of 5 elements, earth, water, fire, air and ether which are represented in body as *dhathus doshas* and malas. Disease is caused by the disequilibrium of the doshas.	(1) *Swasthavritham* or Life style change. (2) Panchakarmas eliminating therapis or Sodhana chikitsa (3) Suppression of symptoms by drugs or *samana chikitsa*, *padhya* or correct food is stressed.	Partial temporary benefits, reduces severity of symptoms.
Sidha	Sidha is largely based on Ayurvedic concepts and is likely an intermingling of the Aryan and Dravidian philosophy, Pharmacology and therapeutic procedures. The system is depicted in Thirukural by Thiru Valluvar of the first century in Tamil. Disease and death occur due to the deranged humours - *vatha, pitha* and *kapha*.	The use of processed metals and minerals are predominant in Sidha	Scientific data on prognosis is not available.
Unani Medicine	Amalgamation of Greek, Arabian and Indian medicine. Rooted in prehistoric evolutions this system started flourishingly from 7th century through the Mughal era in India. Tetra humour theory: When these humours are present in the right proportion the body	Drug therapy with restriction in diet and life style. Raw food (fruits) is advocated. Drug therapy is advised only if fruit therapy fails.	Scientific data on prognostic status is not available.

System of Medicine	Etiology, Philosophy and History	Therapy Methods for Asthma	Prognosis for asthma
	remains healthy. For restoring health restore the balance of these humours.		
Homoeopathy	Based on the principles of 'like cures like', Homoeopathy holds the view that the bodily agents that bring about symptoms of sickness can cure the cause those very symptom when used in extremely diluted form. Samuel Hanneman published his theories of Homoeopathy in 1810.	Uses 'proved; drugs of varying potencies.	Cure and partial cure are reported. Controlled studies on therapy effect and prognosis not available.
Modern Medicine (Allopathy)	Originated through ancient Egyptian and Mesopotamian Medicine. Hypocratus the father of Modern Medicine believed in the tetrahumour theory. The present practice of Modern Medicine follows the scientific approach in eteology, diagnosis and therapy. Many disciplines of scientific knowledge is incorporated.	Uses mostly drug therapies and surgical interventions. For asthma drug therapy.	Suppressive drugs are very effective in controlling the symptoms of asthma. Permanent cure is not reported.
Orthopathy (Nature Cure)	Flourished in US after the emergence of homoeopathy. Disease symptom is conceived as a self balancing mechanism of the body. Etiology is toxemia due to wrong nutrition, such as wrong food, air, water, etc.	Suppression of a symptom cannot be accepted as cure. For a real cure, the cause is to be eliminated. Major therapy is nutritional correction.	Scientific data on prognosis not available about asthma.

To cite an example that the ancient American Indians were aware of the *trihumor* theory (known as *tridosha* in *Ayurveda*) In the therapeutic procedures also there are commonality observed. All the systems

emphasize preventive measures and healthy life styles. The demerits of drug therapy and surgical measures are known to the systems. Only Orthopathy (Nature cure) seems to reject the suppression of symptoms through drug and surgery.

Disease is not conceived as negative in Orthopathy. It is only a state of the depletion of bio energy. The symptoms often work as a warning signal, that something is wrong with the body.

It can be concluded that most of the systems of medicine are envisaging very similar eteological foundations.

So the 14th hypothesis is rejected.

Objective 4

To assess the therapeutic procedures prevailing in various systems of Medicine in comparison to the present therapy intervention

In the present study a self report regarding the cure of asthma by each patient was analyzed.

Table 4.29

Number of Patients reported cure from asthma
after the 40 days of therapy intervention

	Cured	Symptoms reduced	Slight reduction in symptom	No change	Symptom increased	Total
Number of subjects	59	3	2	0	0	64
Percentage	92	5	3	0	0	100

The number of patients reported to have a cure from asthma after forty days of therapy intervention. 92% of the sample reported that their asthma was cured (male 35 and female 28). Here 'cure' is considered as the patients are able to breath smoothly without the help of any drug of chemicals. 5% of the patients did not get a complete cure but the severity of their symptoms were reduced. 3% of the patients had only a slight improvement. This level of a cure rate is very high. Seven patients have reported a relapse. Patients who were depended to drugs containing cortisones are usually found to face with relapse. In such instances they were instructed to follow the same camp procedures. For such people, a complete cure was found possible within 3 to 4 months.

An overview of the studies on asthma, informal interviews with various medical practitioners and the observations made and experiences derived from the psychonutritional camps leads the investigator to the following inferences. The therapy procedures prevailing in various medical systems do not claim a complete cure of asthma. Drugs and dieting only

reduces the severity of the symptom temporarily. A high rate of complete cure is found only in the present psychonutritional therapy intervention.

So the 15th hypothesis that 'the therapeutic procedures prevailing in various systems of Medicine are efficient in curing asthma' is rejected.

Objective 5

To examine the psychodynamics of asthma in the light of the present study.

It is generally accepted that asthma is a psychodynamic disorder. The elaborate survey of research presented in chapter 1 and 2 reveals this aspect. Psychodynamics of asthma reveals the psychological implications in the etiology, triggering of symptoms and the recovery from the symptoms. But the exact way it operates in this disease is not understood properly because the emotional factors also operate mutually and reciprocally. The release of energy from the brain and associated nerveus for the full functions of the bronchial tract seems to be disturbed from the early stage of development of the asthmatics.

Psychodynamics is the study of human behaviour from the point of view of motivation and drives depending largely on the functional significance of emotion, and based on the assumption that an individuals total personality and reaches at a given time and the product of interaction between the conscious /unconscious mind ,genetic constitution and their environment. In medical practice psychodynamics is defined as systematized study and theory of psychological forces that underlie human

behaviour, emphasizes the interplay between unconscious and conscious, motivation the functional significance of emotion. The original concept of psychodynamics was developed by Sigmund Freud. The mental forces involved in psychodynamics are often divided in to two parts. 1. Interaction of emotional forces: The interaction of the emotional forces that affect the behaviour and mental state, especially on a subconscious level. 2. Inner forces affecting behaviour: Study the emotional and motivational forces that affect behaviour and status of the mind.

Here in the enquiry of psychodynamics of asthma patients the personality test results (IAS Rating Scale) are used. The mean raw score and their corresponding mean percentile score of 64 asthma patients are presented in table 4.30. The mean score and their corresponding mean percentile scores of another pathology sample of alcoholics (n=40) a matched control group of normals (n=40) are also presented.

No significant sex difference was observed in any of the personality variables studied here. So, the male female scores are combined. The mean inertia scores of the asthmatic is 26 with a percentile of 65. Almost a similar trend is found in another pathology group of alcoholics (mean raw score 25 and percentile 63). The normal subjects had a mean raw score of 14 with a percentile of 29 (This data of alcoholics and normals are reported by Ashraf, C. and Baby, J. (2007) and is reproduced with permission).

TABLE 4.30

Distribution of Mean Scores and their corresponding centile scores in IAS of various samples

Sample	Inertia		Activation		Stability	
	Raw score	Centile score	Raw score	Centile score	Raw score	Centile score
Asthma (n=64)	26	65	23	41	56	49
Alcoholics (n=40)	25	63	28	49	52	48
Normals (n=40)	14	29	21	19	70	86

The high rate of inertia in both the pathology groups are indicative of the psychodynamics. An asthmatic patient is likely to face so many psychological problems such as anxiety and other adjustment problems as a result of their inability to breath. The inertia level of both the pathology group are very high from that of the normals.

The activation level (mean score 23 and percentile 41) of asthma sample is very high that of normals (mean score 29 and percentile 19). Similar high rate of activation is found in alcoholic also (mean 28 and percentile 49).

The normal subjects are having a very high mean score of 70 for stability with a mean percentile of 86 while the asthma group is having a mean stability score of 56 with a percentile of 49. The score pattern is the same of the psychosomatic group. The same low status of stability is demonstrated by other pathology group of alcoholics with a mean score of 52 and a mean percentile score of 48.

A man with a great deal of stability has the maximum stress tolerance (Mathew V.G., 1995). He has also a sensitive discriminating nervous system. He responds to delicate things like incongruity of instructions and moral contradictions.

Mathew V.G. (1995) theorizes that root personality characterised by a low activation and moderately high inertia and stability predisposes a person to pathology. Here in the patient population a high level of inertia and moderate level of activation and stability are demonstrated by both the pathology group.

It can be concluded that the psychodynamics of asthma patients are high in inertia (mean percentile 65) and below average activation (mean percentile 41) and average stability (mean percentile 49). It is very clear that normal group are having a very high level of stability and low levels of inertia and activation (Mean score 70 and percentile 86).

This findings clearly establishes that there exist a different personality pattern of asthmatics that is different from that of normals.

So the sixteenth hypothesis is accepted.

CONCLUSIONS

1. The prognostic status of asthma in various systems of Medicine is very poor.

2. The body weight of the asthma patients came to a normal status after the therapy intervention.

3. The blood pressure of the asthma patients remained in normal status after the therapy intervention.

4. The hemoglobin of the asthma patients decreased in male asthma patients while in female asthma patients increased.

5. The RBC count of the asthma patients are significantly reduced and remained within the normal range.

6. The WBC count after the therapy intervention remained constant within the normal range.

7. The polymorph count of the asthma patients was significantly reduced and remained within the normal range.

8. No significant difference was observed in the percentage of lymphocytes in male and female asthma patients and it remained constant after the therapy intervention.

9. Significant reduction was found in the eosinophil count and it remained within the normal range.

10. The ESR rate was significantly reduced in the male patients but it did not come to the normal range. The ESR rate of the female remained in the normal range before and after the therapy intervention.

11. The blood sugar of asthma patients significantly reduced and remained in the normal status for both the male and female groups.

12. Blood urea was significantly reduced in both the male and female subjects and remained in the normal range.

13. Albumin content of the urine was significantly reduced in both the male and female asthma patients. It remained within the normal range before and after the therapy intervention.

14. The etiological concepts envisaged in various systems of medicine are not different.

15. A therapeutic procedure prevailing in various systems of medicine are not efficient in curing asthma.

16. There exist a clear psychodynamics of asthma.

Limitations of the study

1. The data collected in physiological variable such as blood and urine analysis coould not be done in a single laboratory by same technician, as the data was collected from different districts at different times, uniformity of the analysis could not be maintained.

2. The variable studied could not be compared to that of a control sample.

Scope for further study

1. The cure methods and therapy packages used in this study can be repeated for other disease categories according to the philosophy of psychonutritional cure.

2. Well controlled studies should be done on the impact of raw food diet and its resultant consciousness and behaviour.

3. Elaborate empirical study should be done on the efficacy of various therapy systems, comparing the psychonutritional cure methods.

4. Studies should be done to establish the differential impact of cognitive, behavioural, temperamental, nutritional and yoga variables in the cure process of various diseases using advanced statistical techniques.

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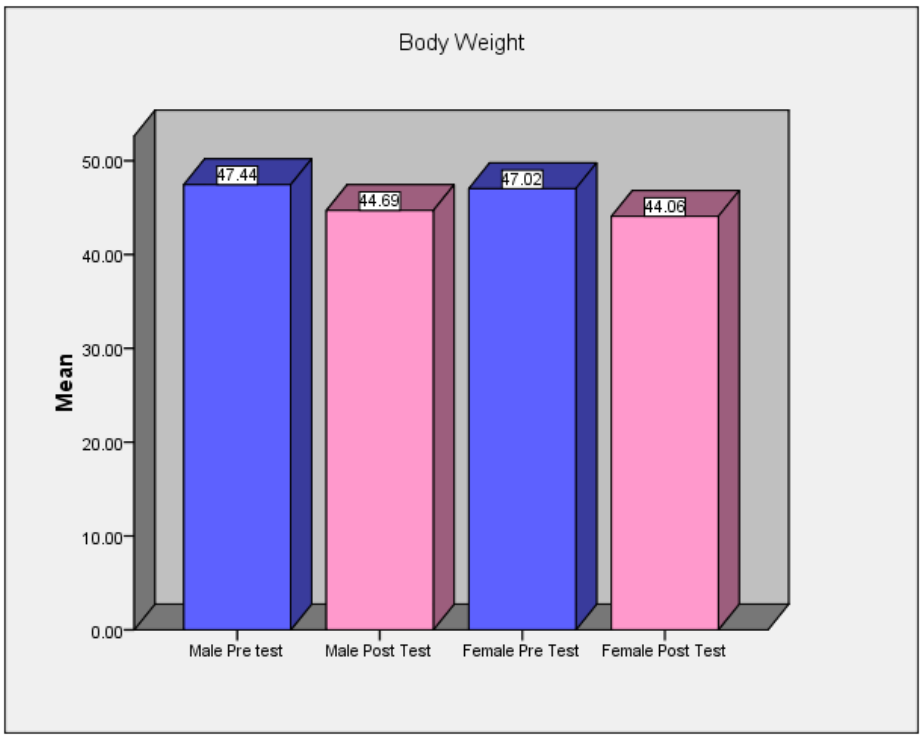
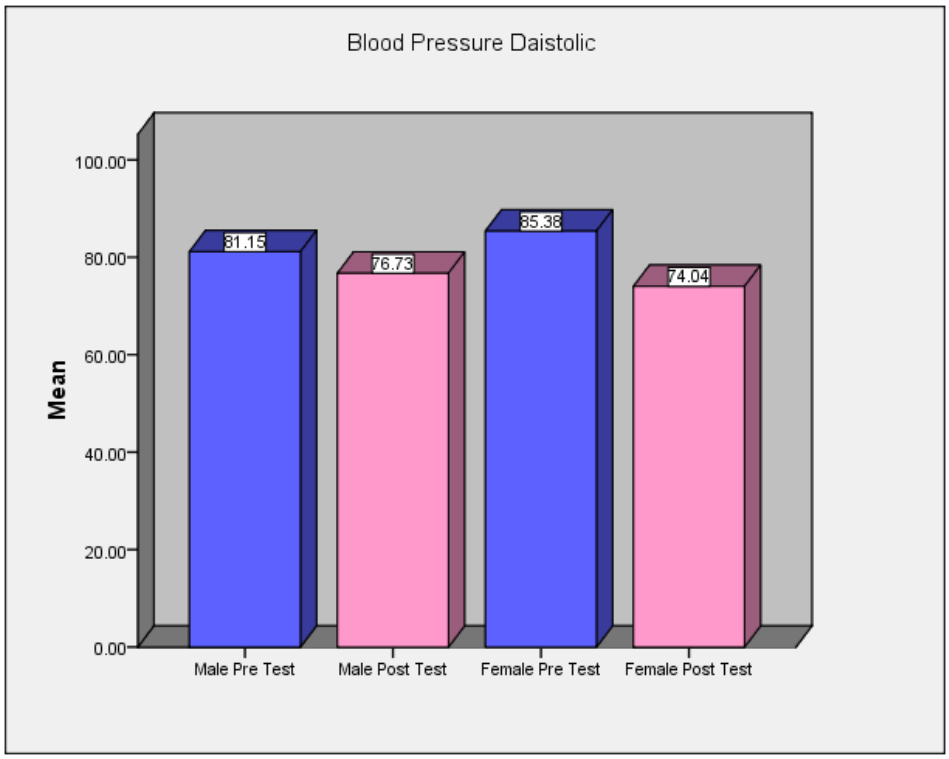
APPENDICES



Histogram showing pre intervention mean and after intervention mean scores (kg) in body weight of male and female asthma patients



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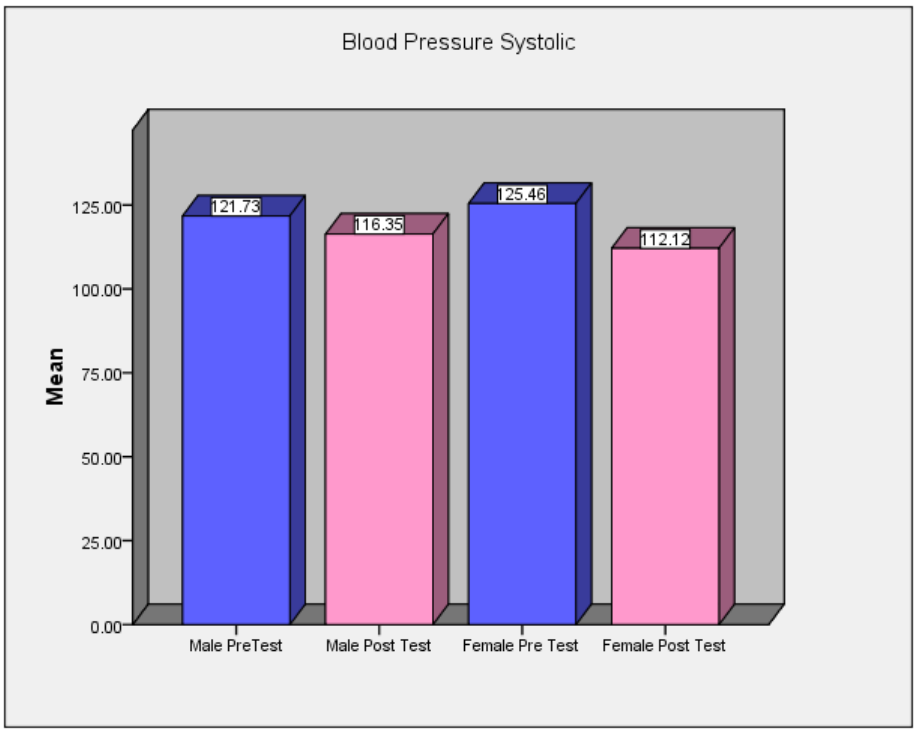

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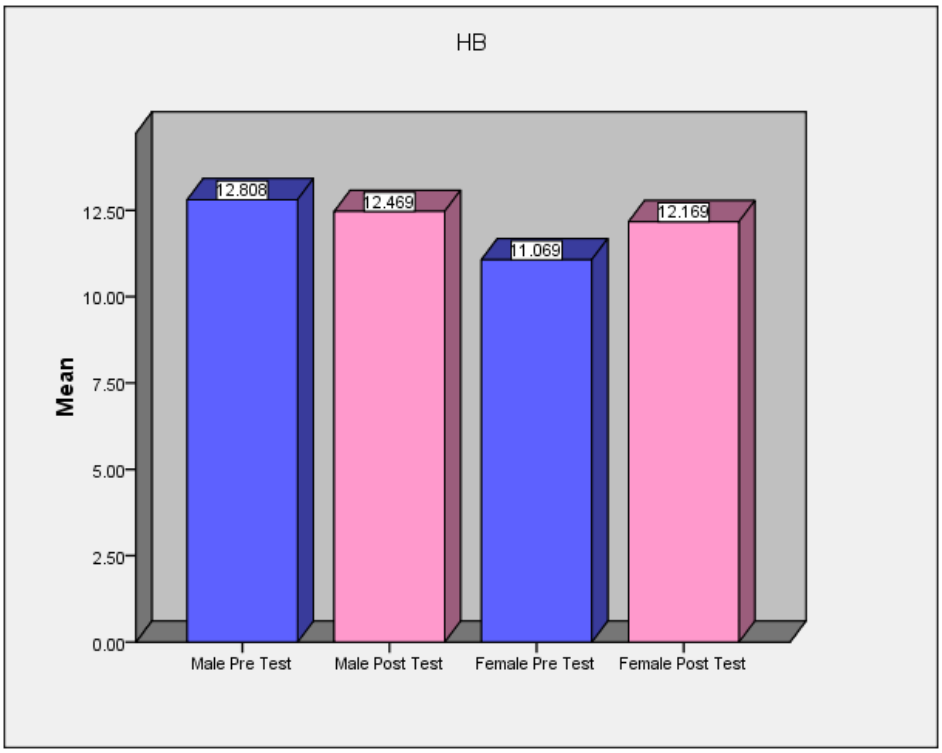

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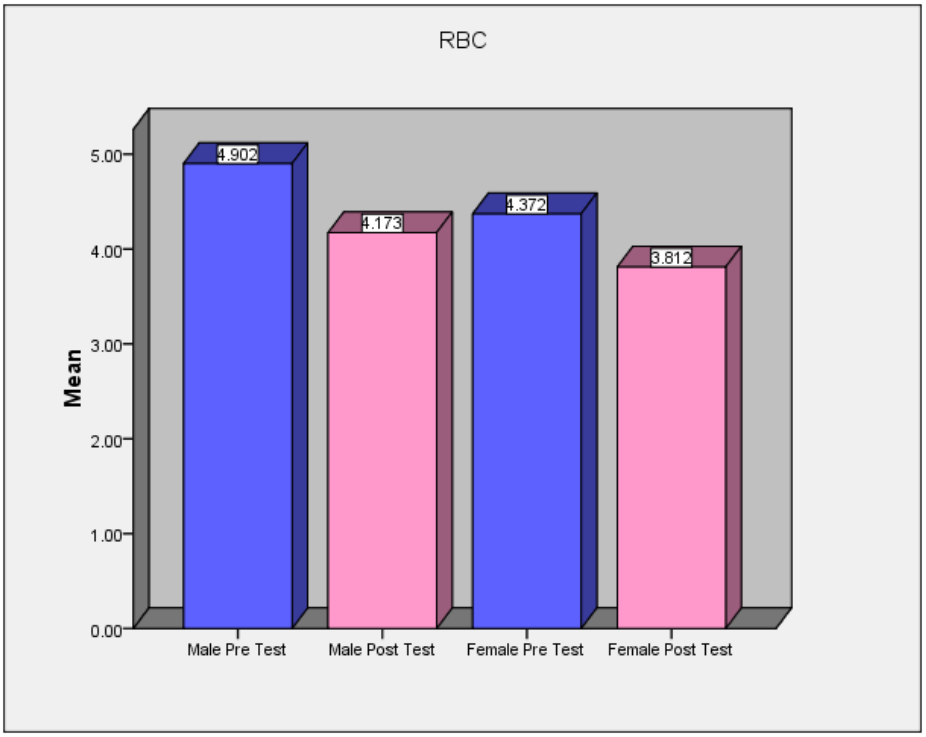
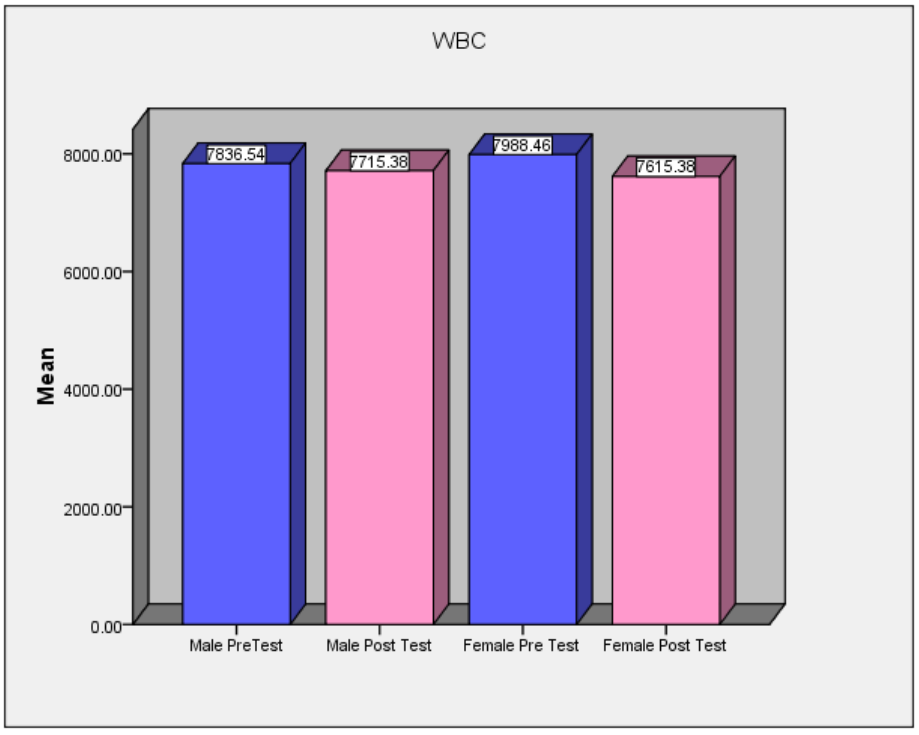


Histogram showing pre intervention mean and after intervention mean scores (in mm^3) in RBC of male and female asthma patients



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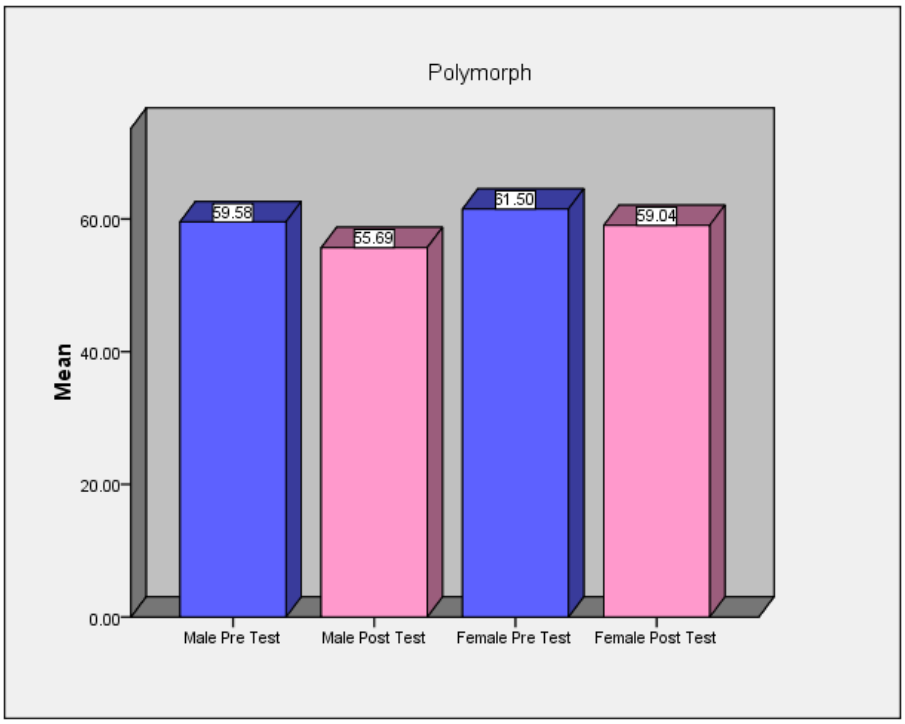
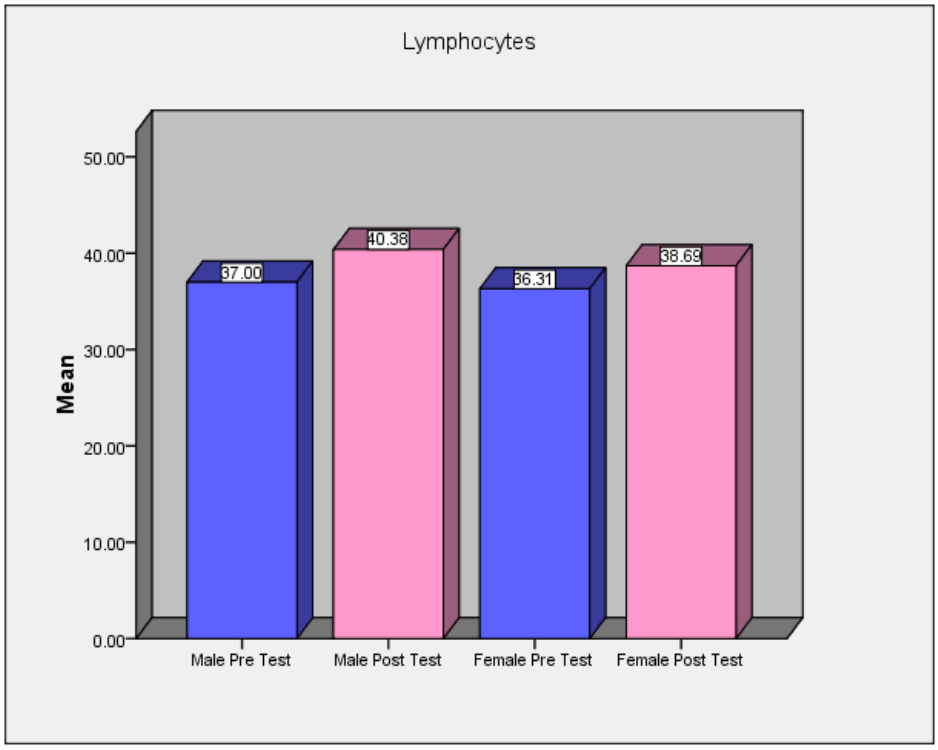
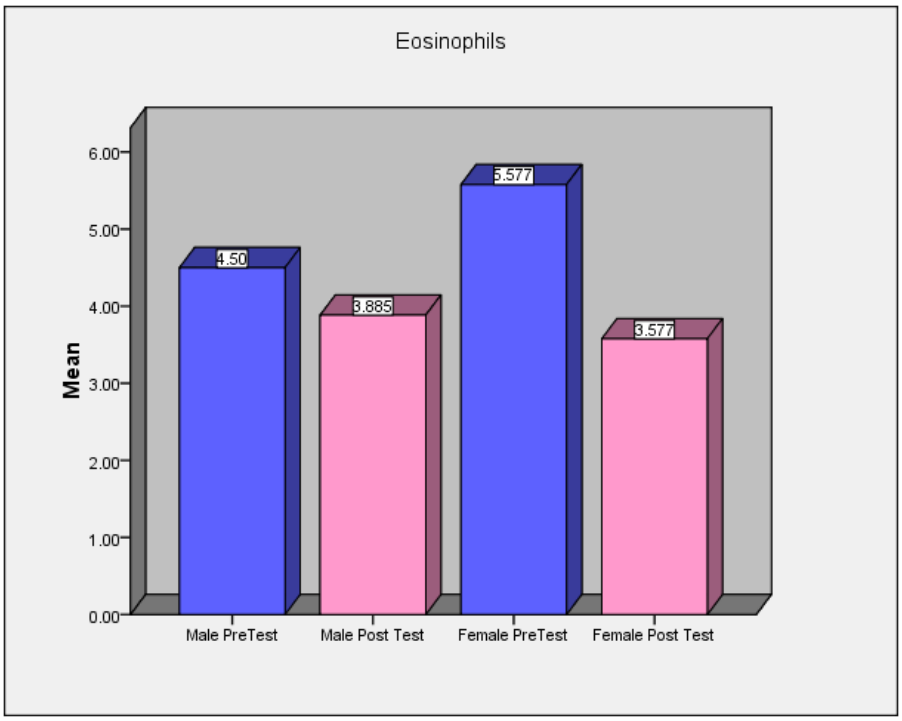


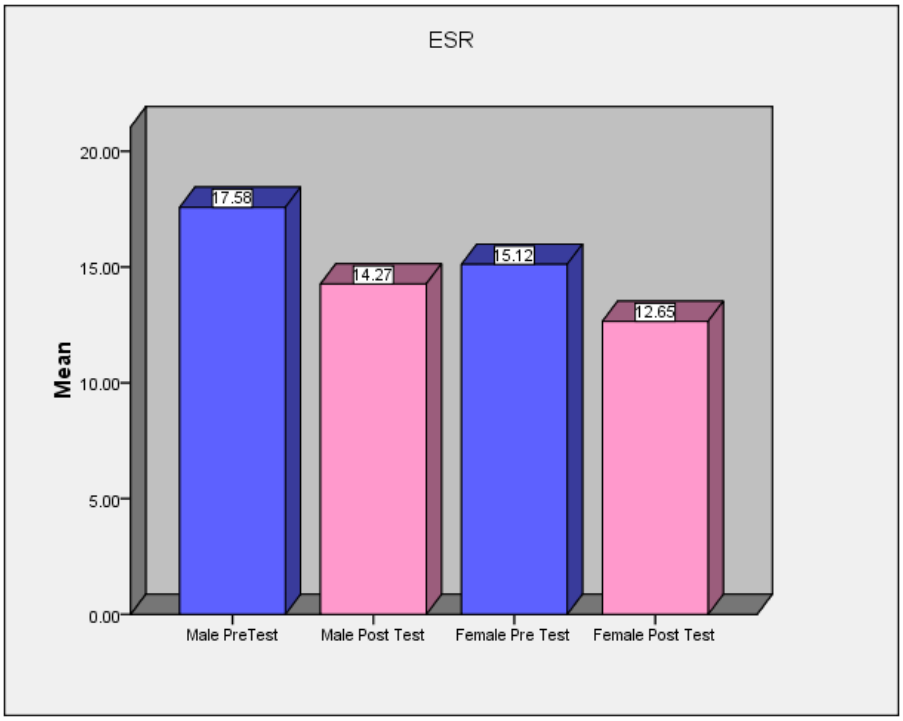
Histogram showing pre intervention mean and after intervention mean scores (percentage) in Polymorph of male and female asthma patients



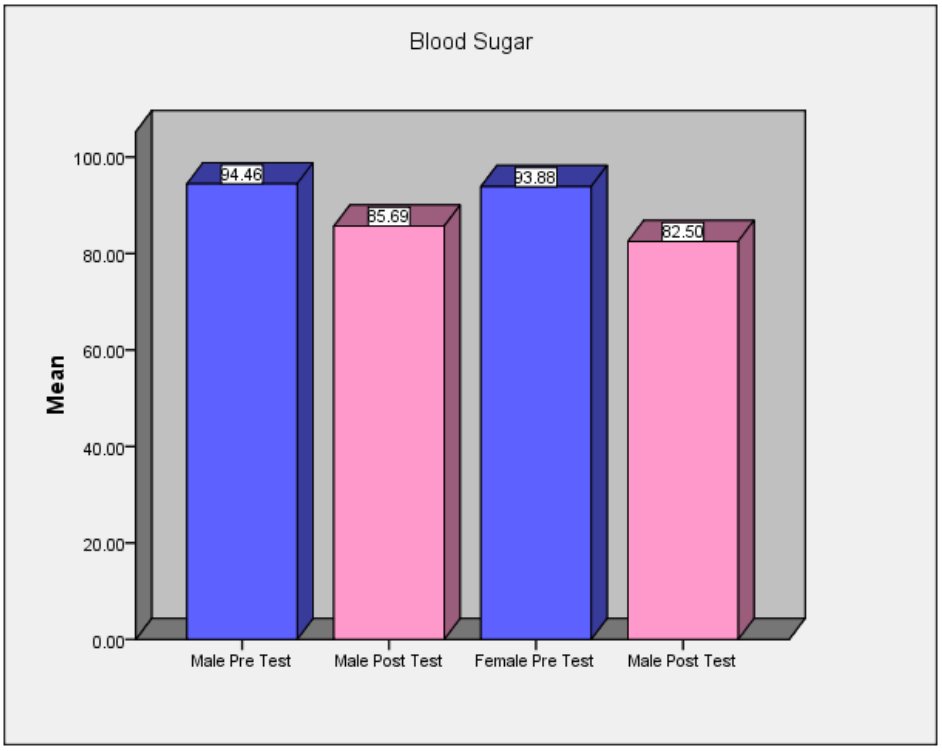
Histogram showing pre intervention mean and after intervention mean scores (percentage) in Lymphocytes of male and female asthma patients



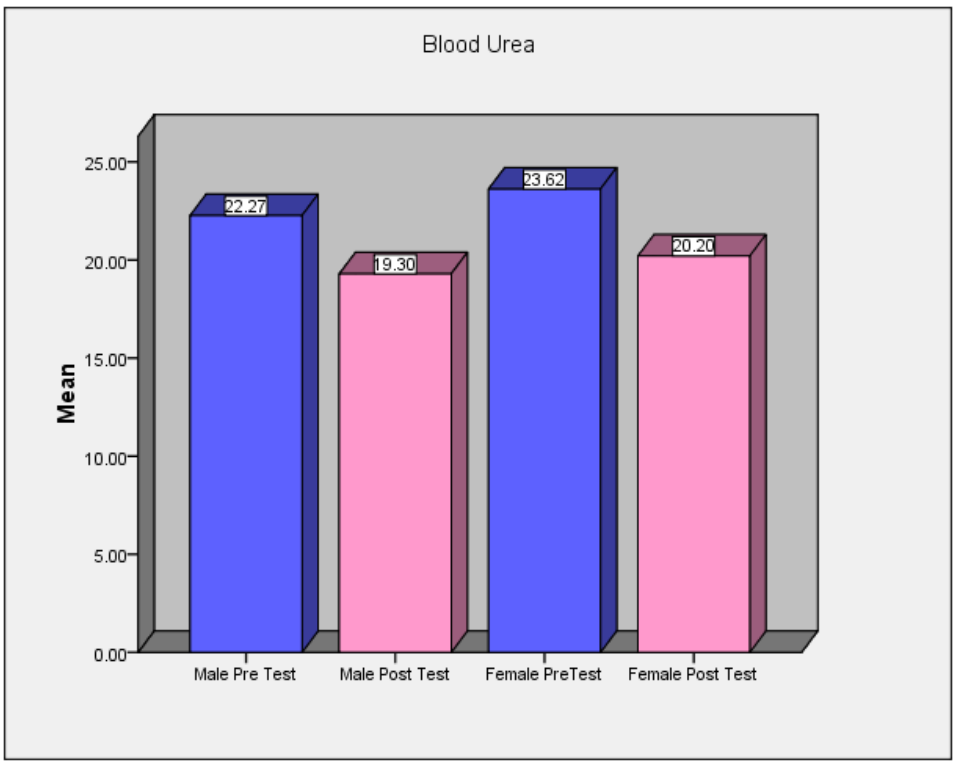
Histogram showing pre intervention mean and after intervention mean scores (percentage) in Eosinophils of male and female asthma patients



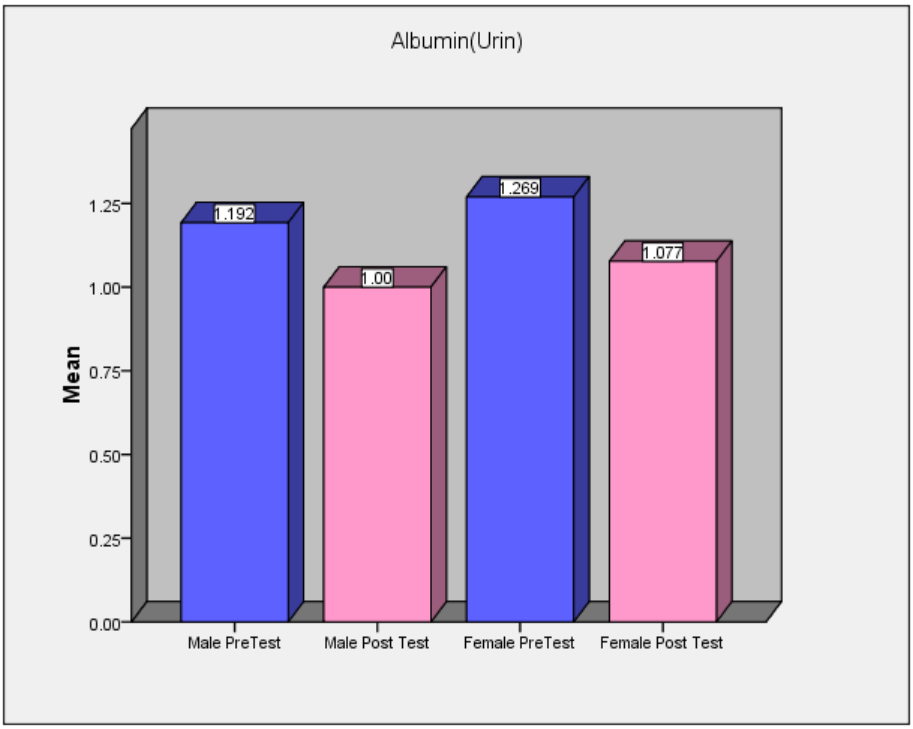
Histogram showing pre intervention mean and after intervention mean scores (percentage) in ESR of male and female asthma patients



Histogram showing pre intervention mean and after intervention mean scores (in mg) in Blood Sugar of male and female asthma patients



Histogram showing pre intervention mean and after intervention mean scores (mg) in Blood Urea of male and female asthma patients



Histogram showing pre intervention mean and after intervention mean scores (mg/dl) in Albumin (Urin) of male and female asthma patients

APPENDIX IV

RELAXATION: THE YOGASANAWAY

A SELF HELP MANUAL FOR THERAPISTS AND TRAINERS

There are altogether about 108 methods of yogasana training. Only slight variations are observed in these methods. One asana can have various versions. The present self help manual describes 23 postures of a basic course. The course is designed based on empirical and experiential foundations. The following are the salient features of the course.

1. The participants are instructed to observe silence (*mouna*) during the entire session.
2. Participants are allowed to breath according to their requirement. Slow deep and steady breathing is encouraged. No any specific instruction for inhale or exhale.
3. A zen meditation technique of observing breath is merged in the asanas.
4. Mixing of bodily exercises with yogasanas is not allowed.

Introduction

Yoga is derived from TANTRA an ancient time-tested science describing different systems for increasing the speed of human evolution. The Sanskrit word '*Tan*' means 'expansion of consciousness' and '*tra*' means 'liberation of energy'. The merge of tantra with the philosophy of Vedanta formed the system of Yoga (Saraswathi, S.S., 1983). Yoga and tantra do not belong to India, but a common inheritance of all mankind. The tantric philosophy and belief is to let the mind be, for what it is and where it is, not to interfere. There is no need to fight with the mind, follow it and know it well.

According to tantra and psychology we must observe analyse and respect whatever thoughts or experiences come to our mind. The aim of *tantra* is to liberate the mind from the bonds of matter *prakrithi* that is from patterns, formations and impressions. Religions restrict us from 'bhoga' but tantra says *yoga* and *bhoga* should be integrated.

Yogasanas lead us to *Dhyana* (meditation) through the stages of *Prathyahara* and *Dharana*. The classical definition of meditation in

Patanjali's *Yoga Sutra* is that 'when the mind has been able to transcend the knowledge of smell, sound, touch, form and taste and at the same time when the consciousness is functioning around one point'. Concentration is not *dhyana* but the way to *dhyana*. There are no techniques for dhyana. It is a state that arises spontaneously. Yogasanas and meditation are intended to bring about that spontaneous state of *dhyana*.

Yoga is union – the integration of body mind and psyche through heumoural and hormonal balance, elimination of toxic substances from body, increased blood circulation, and alerted immune functions through proper dispersion of *prana* all over the body. Individual transformation through experiencing is more important than intellectual reading or discussing on yoga.

It is always better to learn yogasanas from a teacher (*guru*). But it is not impossible to learn Yoga from properly prepared audio, video and print media devices. The success depends on your motivation and enthusiasm. Be very *careful* about the following:

1. Judge a teacher for his yogic personality. Avoid professional *gurus* and showmanship groups.

2. All movements should be slow and steady (as if the slow motion in movie) without any jerking, shivering and wavy motions. Excess, sweating, reddning of eyes, back pain, cramps and unhappiness after doing asanas are indicative of wrong-doing. However such problems are likely in the initial stages of training.
3. An asana should be done in physical and mental relaxation. More relaxation leads to more perfection in postures.
4. Yoga is opposite of ego. So the psychological transformation is more important than bodily postures. Do not approach yoga as a bodily exercise.

GENERAL INSTRUCTIONS

1. Do yogasanas on a mat or sheet (non synthetic) in order to avoid earthing of the energy converged in body.
2. While practicing asanas in group, please do not look at other participants and make comparisons. Follow instructions from the teacher and see demonstrations.
3. Do not do asanas when you are ill, extremely tired or upset. However tiredness and mental upset can be relieved by Savasanam and meditation. Avoid asanas during menstrual periods.
4. Avoid asanas after a heavy meal. Practice asanas at least 4 hours after a meal. This restriction is not applicable for those who live on raw food alone (fruits, nuts and vegetables in the uncooked form).
5. Morning around 5 to 6 is an ideal time for yogasanas. Evening sessions also can be held.
6. Yogasanas should not be a torture or violence on body and mind. Limit practice according to your mental setting.

7. Practice nonviolence (*ahimsa*) on all creatures and extend awareness to immediate and distant surroundings and nature.
8. Reading the writings on the Budha and the works by Jiddu Krishnamurthy, OSHO, Remana Maharshi, etc will accelerate the transformation in us.
9. Practice yogasanas in empty stomach after defecation. But if you have problem of constipation, do not bother, yogasanas will rectify the problem.
10. Avoid animal food, stimulants and intoxicants. If you find it difficult, do not worry. Yogasana practice will help you to avoid them.
11. The effect of yoga in you can be realised by the development of virtues in you along with the improvement of postural perfection.
12. Many people ask whether stopping yogasana practice will adversely affect their health. No. No harmful effects. But you will not get the benefit of it. That is all.
13. You can limit your asanas to a few which you like the most, especially when you have less time for practice. However in such situations the number of forward-bending asanas and backward-bending asanas should be almost equal. The sequence of yogasanas in this is made accordingly.

INSTRUCTIONS FOR INSTRUCTORS

1. The instructor should sit in Padmasana while giving instructions. He should be very alert, calm and relaxed. He should be visible to all participants and all participants should be visible to him.

2. The tone of instruction should be pleasing and gentle. Harsh tone and words should not be used. Instructions should be natural and genuine. Elongating a word may induce hypnotic trance (especially in Savasana) which should be avoided. Hypnosis is anti-yogic (Refer Swami Vivekananda for details).

3. Your instructions should be minimum and well edited. Too much of talking should be avoided. After the first three or four sesions instructions should be the bare minimum so as to enable the participants to experience silence. Once they have grasped the details you need announce the name of the asana by 5^{th} or 6^{th} session onwards.

4. Silence should be induced throughout the session. Tell the participants that talking and doing asanam is harmful. Discourage a participant if he indulges in conversation. Request him to voluntarily control his tendency to talk.

5. Request the participants not to look at others (including the instructor) while doing an asana. In a posture if you turn your head to look at another person it becomes a wrong posture which may be harmful.

6. The demonstration of postures whenever necessary can be done by the instructor or another expert in front of the instructor. You can make use of a participant who is good in postures for

demonstration. If the instructor himself is demonstrating he should avoid talking while demonstrating.

7. Usually this basic course should be held for 10 continuous days. The 23 postures should be taught in the first 6 sessions and the next 4 sessions should be used for corrections of postures. *First Session* - postures 1 to 6. *Second session* - postures 1 to 8. *Third session* - 1 to 12. *Fourth session* - 1 to 16. *Fifth session* - 1 to 18. Sixth session 1-23. Before closing each session Savasanam should be given for 3 to 5 minutes followed by the zen meditation for 2 minutes and then chanting the OMKARA Manthra three times.

8. This course can also be held in 3 days or in 5 days camps. If so there should be evening sessions too. Postures may be taught in the first 5 sesions and follow up sessions may be held afterwards for corrections of postures (Courses can be held for two day's sessions per week for 5 weeks).

9. During the first two-three sessions each asana can be repeated twice or thrice. But by the third session learnt asanas need be done only once in order to keep up time.

10. Yogasana postures should be self-initiated movements. The instructor should not support or lift any body part of the practitioner. As far as possible, the instructor should not touch a practitioner except on falling or locked up position. (Supporting body on wall also is wrong).

BEGIN THE YOGA SESSION

Arrange the Yoga session in a calm, airy and safety-feeling place where all the participants should be visible to the instructor.

INSTRUCTIONS

This is a basic course of 23 postures. We will begin with a ZEN meditation for calming down. We will not be mixing any bodily exercises in this course. Exercises are predominantly for muscles for *warming up* but yoga is for the mind and is aimed at *calming down*.

Sit in Padmasana or Vajrasana (need not be in its perfect posture in the beginning) or sit cross legged comfortably and relaxed. Spine erect. Have a pleasant face which indicates relaxation. Slowly you close your eyes. Deep breathing long steady breathing without making noise audible to others and without too much stretching of the chest. When you sit in such silence all sorts of thoughts may come to your mind. Please do not try to control your thoughts. Let the thoughts come and go. You pay attention (not concentration) to the air entering your lungs and going out of the lungs. Continue observing this breathing in relaxed

body for about two minutes. (Always practice asanas only after this ZEN meditation).

1. ARDHA HALASANAM - A
(one leg each)

Do yogasanas with pleasant face and relaxed body

Lie on your back (supine position) legs close ... hands stretched close to body ... palms down towards floor ... head straight. All movements should be slow and uniform. No wavy motions shivering and jerks. Slowly raise right leg without bending the knee and stretching the toes forward. Raise only upto 45 or 50 degrees . . . not more than that (while raising the right leg, your left leg and other parts of the body should be relaxed). Remain in that position for a while and slowly bring down the right leg. All movements should be slow and steady. Now slowly raise the left leg without bending the knees and stretching its toes forward. Remain in that position for a while and bring down slowly. Keep the right leg and others part of the body relaxed while raising the left leg. Let your face be pleasant. Breathing slow and steady without much noise as per your requirements.

BRIEF SAVASANAM TO BE DONE IN BETWEEN EVERY POSTURE

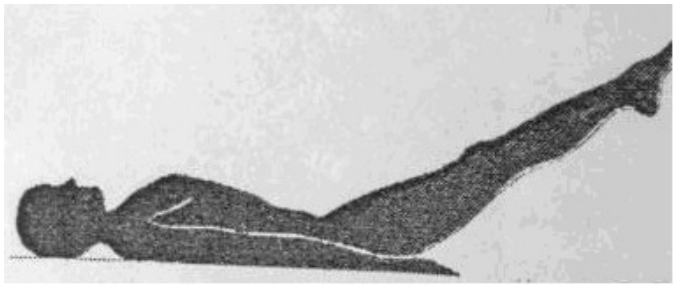
Lie on supine position .... legs a little apart .... hands apart .... palms upward .... turn your head to left or right. Slowly close your eyes. Relax your entire body ... no tension anywhere in the body ... loosen every part of the body. Breath slowly and deeply and steadily (without making noise audible to person sitting near you). Take long breaths and observe breathing. Pay attention to air entering the lungs and going out of your lungs. Do not control your thoughts ... observe breathing ... feel the air entering and going out of your lungs in complete relaxation. You can avoid thoughts by observing breaths.

***Note*:** The duration of this brief Savasanam after every posture may be limited according to the availability of time for you. In the initial stages of practice you may require one or two minutes and after attaining mastery you may need less time.

2. ARDHA HALASANAM - B

(Both the legs together)

Lie down on back ... legs close ... hands close to body .... palms down. Head straight. Slowly raise both the legs together without bending the knees and keeping the toes stretched forward. Raise only upto 45 or 50 degrees ... not more than that. Remain in that position for a while and bring down very slowly. Now relax in savasana. While raising the legs all other parts of the body should be relaxed.



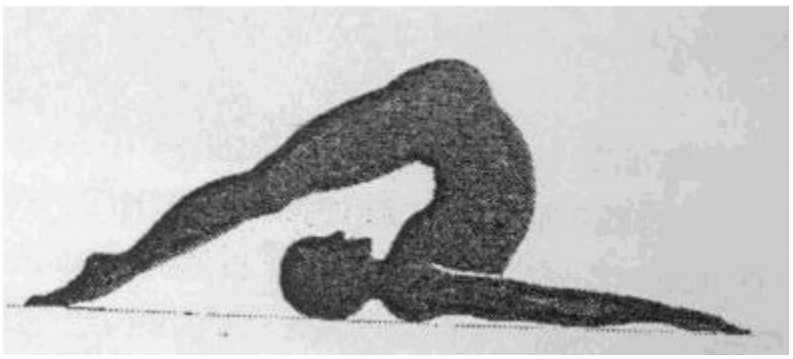
Breathing slow and steady as per your requirements. All movements should be slow and uniform without waving shivering or jerking.

Relax in Savasanam.

3. POORNA HALASANAM

Lie on back, hands close to body palms down ... legs close ... raise both the legs without benting the knees and stretching the toes forward ... and bring the legs behind your head by raising the buttock and bending the spine. Do not struggle for the final posture. Do only up to what you can do. Overstraining is harmful. Now remain in savasana.

The instructor in group session should be vigilant and should help if any individual is unable to bring back his body to the earlier position. Instances of participants struggling in locked up condition may happen.

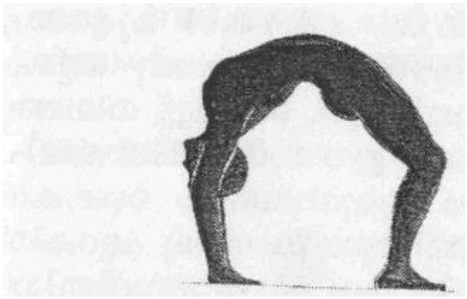


Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

4. CHAKRASANAM

Lie on back. Keep your legs slightly apart and fold them bringing the heels near your buttok. Raise your hands and place it behind shoulders keeping the palms on floor ... fingers towards the shoulders. Slowly raise your buttok first then abdomen, chest and shoulder area and then your head. Remain like an arc and loosen the neck and keep the head hung. Remain in this final posture for a while and come down very slowly ...

bring down the head and touch it the floor and then the shoulder and chest area, the abdominal area and finally the butok. Unfold the legs and bring back the hands.

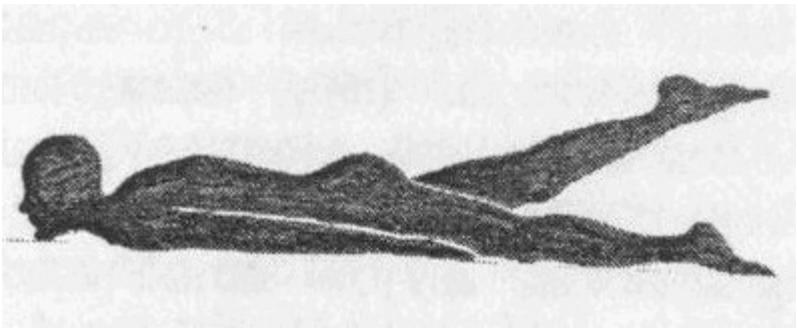


Breathing slow and steady without making noise as per your requirements. Relax in Savasanam.

5. ARDHA SALABHASANAM

(one leg each)

Lie on stomach stretching the entire body ... hands close to body ... palms upward tuck below your thighs. Rest your head on chin. Straighten your head so as to bring your gaze parallel to the floor. Slowly raise your right leg (45 or 50 degree only) without bending the knees and keeping the toes stretched back. Remain in this final position for a while and bring down the leg slowly. When the leg is raised all other parts of the body should be relaxed. Repeat the same with the left leg.

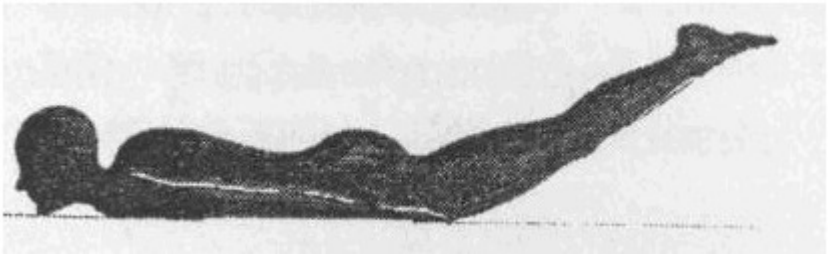


Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

6. SALABHASANAM

(both the legs together)

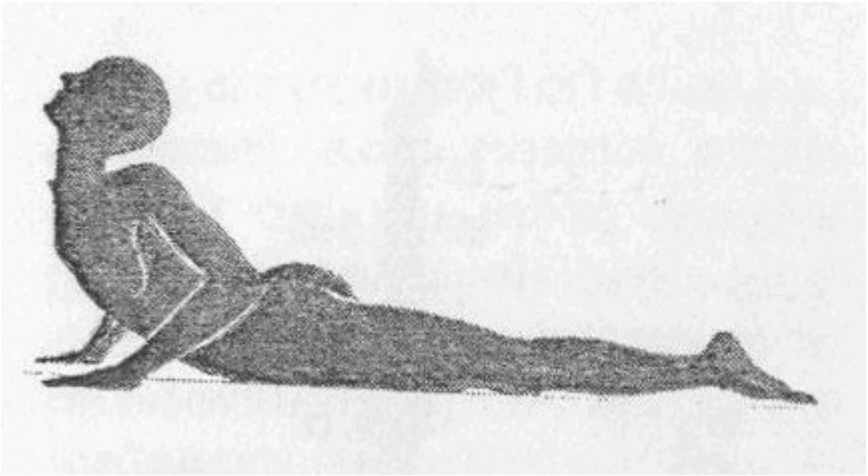
Lie on stomach stretching the entire body ... hands close to body ... palms upward, tuck below your thighs. Rest your head on chin. Straighten your head so as to bring your gaze parallel to the floor. Slowly raise both the legs together without bending the knees and keeping the toes stretched back. Remain in this final position for a while and bring down the legs slowly. When the legs are raised all other parts of the body should be relaxed.



Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

7. BHUJANGASANAM

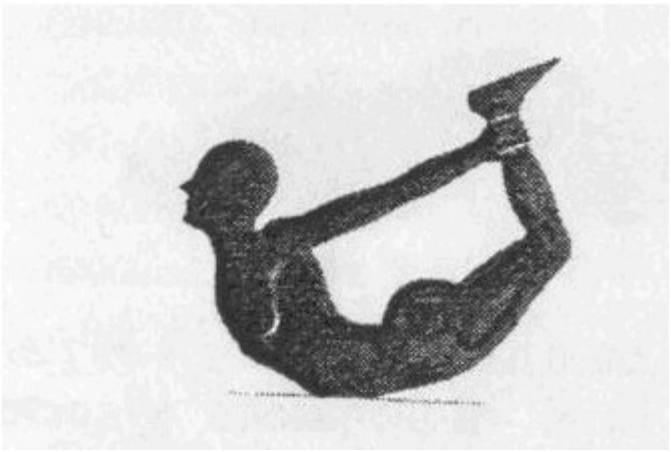
Lie on your stomach. Fold your hands and place the palm just in front of the shoulders ... arms close to body. Keep your forehead on the floor and bent the head backward and slowly raise the head and spine upwards *without exerting force on the hands.* Keep your legs relaxed (do not keep them raised on the toes). Remain in this final posture for some time and come down to earlier stage by bringing down the spine and head and bent down the head until it toches the floor. Unfold the hands.



Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

8. DHANURASANAM

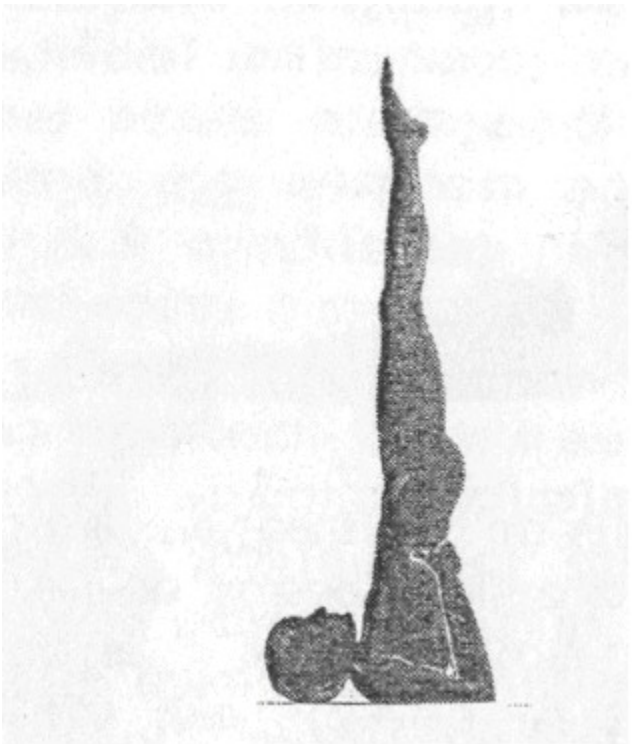
Lie on stomach. Fold your legs and hold them by hands just below the heads. Slowly pull the legs backward (do not pull by hands) so as to raise the leg region and the head region simultaneously of the same height and the hands remain parallel to the ground. Remain in the final position for a few seconds and come back to earlier position.



Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

9. SARVANGASANAM

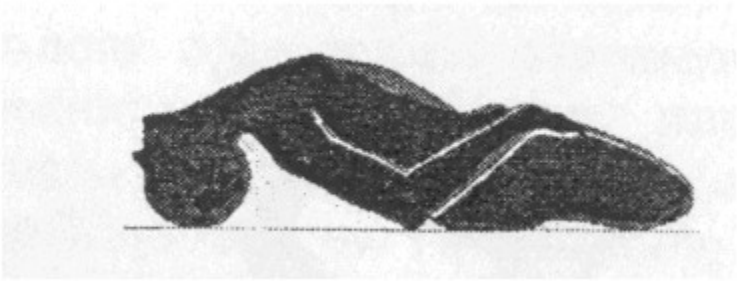
Lie on safine position. Slowly raise your legs and buttock and bring the legs behind the head (as in poorna halasan) and slowly raise it upwards and remain on the back of the head neck, shoulder too and hands keeping the knees and toes stretched upard at 90°. Support your body with hands holding at the sides of the abdomen. Remain in this final posture for a while and back to earlier position by unfolding the hands and keeping it on floor fold the legs ... bring it behind your head ... then slowly come down and rest the back, buttock and then the legs on the floor.



Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

10. MALSYASANAM

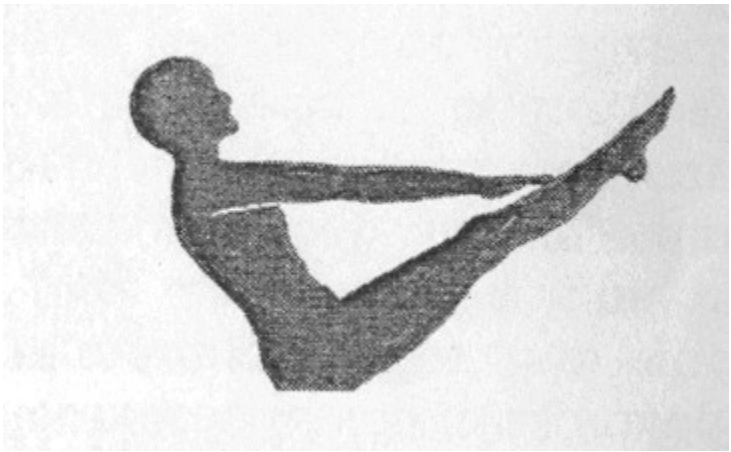
Sit in padmasan – that is keep your right leg on the left thigh (close to naval region) and the left leg on the right thigh. Then slowly lie down supporting your body on each ankles one after another. Raise your hands upwards and bring them behind your shoulders ... keep the palm on floor (fingers towards the shoulders). Supporting on the hands raise the chest part and bend the head backward and rest the head on head-top. Bring forward the hands and rest it on thighs and ankles on floor.



Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

11. NAUKASANAM

Lie on your back stretched, legs together hands close to body and head straight. Slowly raise your legs without bending the knees and keeping the toes stretched forward and simultaneously raise the spine area keeping the head straight and stretch the hands forward. Keep the hands parallel to the floor. Now body rests on buttock alone remain in that final posture for a few seconds and come back to earlier lying position.

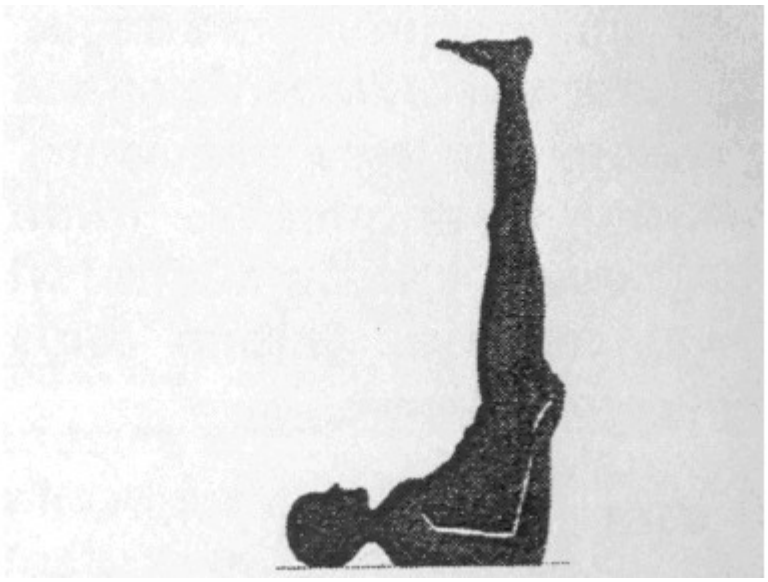


Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

12. VIPARITHA KARANI

Lie on your back stretched. Legs together, hands close to body palm downward. Bring your legs back to your head as in Poornahalasana and lift your legs and buttock upward without bending the knees and not stretching the toes. Support your buttock with the hands. Keep the legs at 90^{o} upwards and remain in this final posture for a while and then come back to earlier position by folding the legs and bringing them back at

your head ... keep your hands on the floor ... bring down buttock and then the legs to the floor.



Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

13. BHADRASANAM

Sit on the floor. Keep your legs facing its bottoms each other and hold them by your hands locking the fingers. Now sit errect, pull the heels towards your anal area and bring down the thighs towards the floor. Remain in this final posture and come back to earlier position.

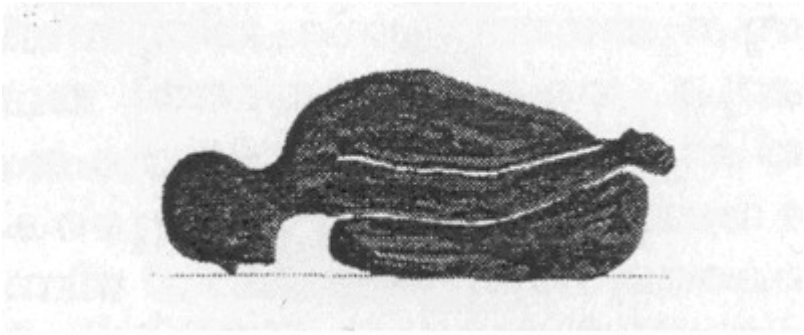
Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

14. YOGAMUDRA - 1

(in Padmasanam)

Sit in Padmasana – that is – keep your right leg over the left thigh and the left leg over the right thigh ... sit straight ... spine errect. Bring lyour hands behind and hold the right ancle with the left hand and the left

ancle with theright hand tightly. Then slowly bent forward lso as to touch the forehead on the floor. Remain in this final posture for a few seconds and come back to earlier position. Do only as much you can. Do not struggle to touch forehead on floor if you cannot.

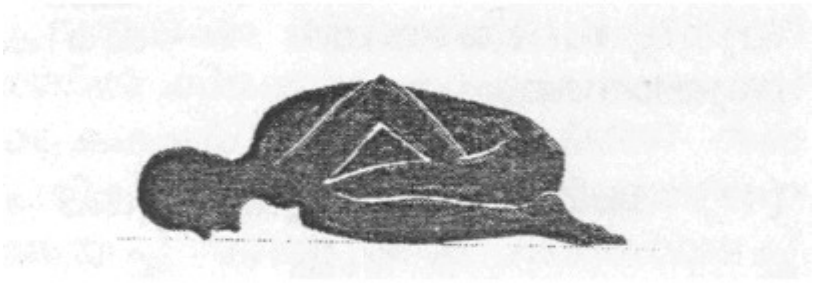


Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

15. YOGAMUDRA - 2

(In Vajrasanam)

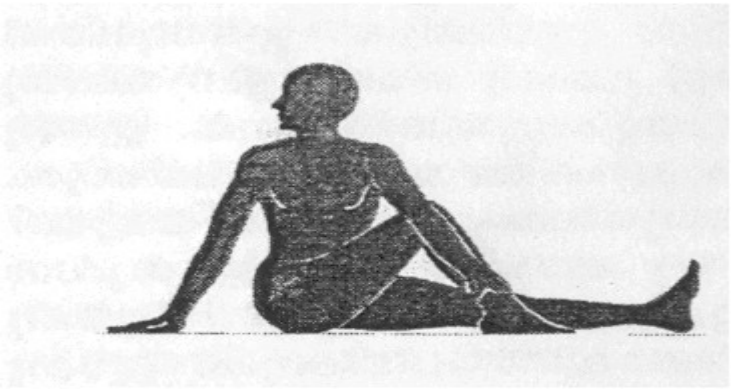
Sit on legs. The right buttock on the right leg and the left buttock on the left leg.The big toes should touch each other while the right heel should be bent towards the right and the left heal towards the left so as to contain the buttocks comfortably on. Now fold your hands to make fists and place the right fist at the right bottom side of the abdomen and the left fist at the left bottom side of the abdomen. Now slowly bent forward and touch the forehead on the floor. Keep the ancles close to body without raising the buttock from the heel. Remain in the final posture for some time and come back.



Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

16. VAKRASANAM

Sit streaching both the legs forward. Fold the right leg and place the right heel adjacent to the left knee. Lift the right hand bring it back and place it on the floor behind (right hand fingers directing toward back). Raise your left hand up and bring it upward the right knee and clutch the right leg at its ankle. Now bring the spine errect and slowly turn your head through the right side towards back upto 180 degrees. Feel the twisting of each vertebral column. Remain in that final posture for a while and come back very slowly, bringing back the head to earlier position.



Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

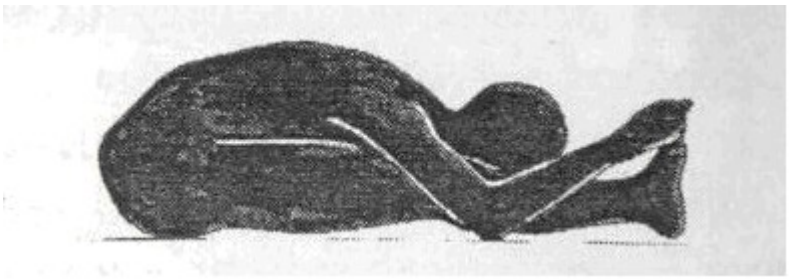
17. ARDHA MALSENDRASANAM

Sit stretching both the legs forward. Fold the right leg and bring it beneath the left thigh. Bend the left leg and place the left foot at the right side of the right leg. Fold the left hand and keep it across the back touching the dorsal palm tight at the left side. Bring the right hand up and move it towards right down and hold the left leg just above the feet. Now turn the head towards left and look back the head turning upto 180°. Remain in this final posture for some time and then come back to earlier state of sitting with legs stretched forward. Bend the left leg and bring it beneath the right thigh. Fold the right leg and place the right foot at the left side of the left leg. Fold the right hand and keep it across the back touching the dorsal palm tight at the right side. Bring the left hand up and move it towards left down and hold the right leg just above the feet. Now turn the head towards right and look back turning the head upto 180°. Remain in this final posture for some time and then come back to the earlier position.

18. PACHIMOTHAMASANAM

Sit stretching the legs forward. Raise your hands and bent forward until your forehead touches the knees. Hold your toes with both hands

touching the ankles on the floor. Remain in the final posture for a few seconds and then come back to earlier position.



Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

19. VRIKSHASANAM

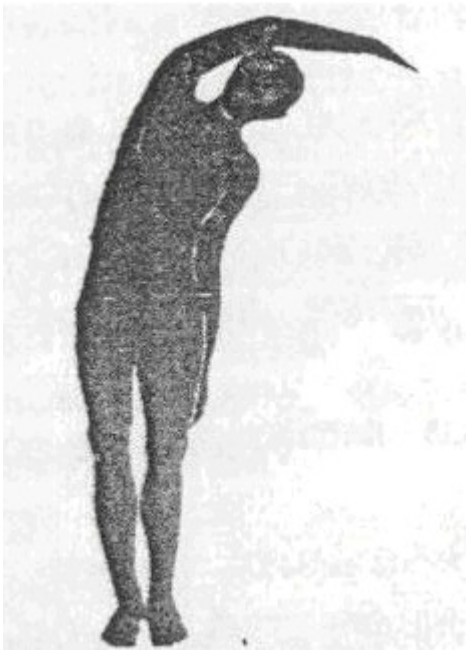
Remain standing legs close. Lift your right leg and hold it and pull the heel upward so as the heal should touch the anal region. Sole touching right at the left ventral thigh. Remain in the left leg properly balancing the body raise your hands up and join the palms above your head and bring the hands down at the middle of the chest. Slowly close the eyes and balance the body. Remain in that final posture for a while and come back to the initial standing position.

Repeat the same procedure for the left leg also. Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

20. ARDHAKADI CHAKRASANAM

Remain standing, legs close. Hands close to body, head straight and spine errect. Slowly lift your right hand up to 90°, turn the palm upward

and raise it further until the arm touches your right ear and still further applying force with the hand turn the head and spine towards left while the left hand is gliding down tightly through the left side. Remain in this final posture for a while and slowly bring back the right hand ... at 90° turn the palm downward and then bring down the right hand. Similarly lift the left hand ... turn the palm up at 90° ... touch the left arm at the left of your head. Turn the head and spine towards right with the force of the left hand while the right hand is tightly gliding down the right side. Remain in this final posture for a while and come back to earlier position by bringing back the left hand ... at 90° turn the left palm downward and bring down.



Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

21. SAVASANAM

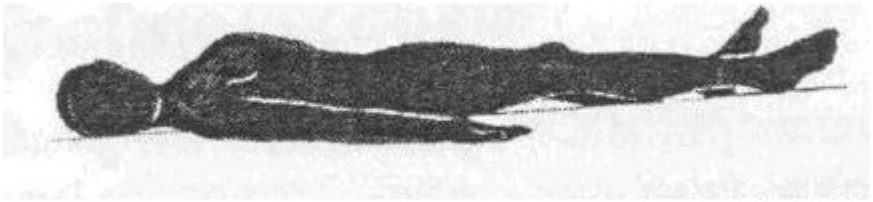
Lie in supine ... legs apart ... hands apart palms up ... turn your head to left or right ... slowly close the eyes. Relax your body completely ... no tension anywhere in the body ... deep breathing – without making noise ... slow and steady breathing ...

Now bring your awareness to the particular body parts I announce and relax that part (without any movement at that part) with more awareness.

Now bring your awareness to your heels ... relax the heels ... relax the upper part of the feet ... bring your awareness to the knees ... relax them ... relax your thighs ... Be aware of your buttock area ... relax that area.

Relax your abdominal area .. be aware of the chest area and relax that area. Now bring your awareness to your hands ... relax the fingers ... the forearm and the upper arm ... be aware of the shoulders ... relax them ... loosen your neck ... relax your neck ... bring your awareness to

your cheeks ... relax your cheeks ... relax your glotis ... and the tongue ... do not hold the teeth clenched, relax them ... relax the lips ... be aware of the nose area ... relax ... loosen your eyelids ... relax them ... relax the eyebrows ... relax your forehead.



Now your entire body is completely relaxed ... no tension anywhere in your body ... deep breathing ... you be aware of the complete relaxation of your body ... deep breathing. Relax further and further as I count from one to ten ... one ... two ... three ... more and more relaxation ... four ... five ... six ... more and more relaxation ... seven ... eight ... nine ... more and more relaxation ... ten .... Now your body is completely relaxed ... deep breathing ... slow and steady long breaths ... be aware of the breathing ... pay attention to air coming in your lungs and air going out of your lungs ... feel the air coming in and going out. Remain in this complete relaxation for 5 minutes in silence ... decide not to fall asleep. Observe your breathing for 5 minutes in silence. (After 5 minutes) ... Now slowly ... very slowly open your eyes and sit in Padmasanam and continue the observation of breathing ... the zen meditation ... we did at the beginning.

22. VAJRASANAM

Sit on legs. Keep the knees close The right buttock on the right leg and the left buttock on the left leg. The big toes should touch each other while the right heal should be bent towards the right and the left heel towards the left so as to contain the buttocks comfortably on. Spine errect and place your hands on the knees stretched. Remain in that final position for some time and then come back.

Breathing slow and steady without much noise as per your requirements. Relax in Savasanam.

23. PADMASANAM

Sit cross legged. Keep your right leg over your left thigh and the left leg over the right thigh. Spine errect. Stretch your hands and keep them on your knees – ventral side upward. Make a circle touching the tip of the index finger and the thump of each hand.

CONTINUE MEDITATION FOR TWO OR THREE MINUTES. PAY ATTENTION TO BREATHING.

FEEL THE AIR COMING INTO YOUR LUNGS AND GOING OUT OF YOUR LUNGS. SLOW DEEP AND STEADY BREATHING.

HAVE A PLEASANT FACE (not to smile).

NOW CHANT OMKAR (OR ANY OTHER MANTHRA OF YOUR PREFERENCE LIKE 'ALLAH' OR 'HALELUYYA') THREE TIMES

Chant together when I say 'Start'.

Take a deep breath ..... start ..... OM .....

Take a deep breath ..... start ..... OM .....

Take a deep breath ..... Start ..... OM .....

Now slowly open your eyes.

Now it is time for you to ask doubts about any aspects of Yogasanam.

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Note: This Yogasana course was designed by Sri. Sreenivasan, a close associate of Jiddu Krishnamoorthi. This self-help manual was presented in a workshop at a national seminar of clinical psychologists at Ayodhya and the same is published in the Journal of Community Psychology (Baby, J., 2004). The manual is based on the experiential insights derived from training programme for about two decades held in the Calicut University

Psychology Department in association with the National Service Scheme activities.