

# INTRODUCTION

*“Healthy plants and trees yield abundant flowers and fruits. Similarly,  
from a healthy person, smiles and happiness shine forth like the  
rays of the sun.” -B. K. S. Iyengar*

Twenty first century has witnessed a land mark development in science and technology including space, defense, atomic energy, computer, internet service etc. By the internet invention we can collect required information within a fraction of second from any part of the world. Due to this advanced scientific technological invention, the body movements of the human being have been restricted. Tension and competitive feeling increased. Man has been felt the prey of stress, hypo kinetic and psychosomatic diseases. So time has come that man should not ignore the importance of any physical activities. Every one desires good health and it is the ultimate objective of all those who want happiness in life. Everyone has to follow good health practices in their routine life. Minor health disorders are quite common to all. In the case of major health problems, the precautionary measures are plenty. Some people control their diseases like blood pressure, diabetes, acidity, asthma etc. by taking medicines regularly. But such practice does not in a way completely eliminate the health disorders; on the other hand it leads to several other adverse health problems.

The continuous, systematic and regular practice of Yoga and any physical activities is an effective tool to maintain good health and also helps eliminate all the dreadful diseases from the human body.

The term Lifestyle means “The Way of People Live”, reflecting a whole range of social values, attitudes and activities. It is composed of cultural and behavioral patterns and

life-long personal habits (e.g., smoking, alcoholism and sedentary life style) that have developed through process of socialization.

Health requires the promotion of healthy lifestyles. In the last 20 years, a considerable body of evidence has accumulated which indicates that there is an association between health and lifestyle of individuals.

Lifestyle diseases characterize those diseases whose occurrence is primarily based on the daily habits of people and are a result of an inappropriate relationship of people with their environment. The main factors contributing to lifestyle diseases include bad food habits, physical inactivity, wrong body posture, and disturbed biological clock. A report, jointly prepared by the World Health Organization (WHO) and the World Economic Forum, says India will incur an accumulated loss of \$236.6 billion by 2015 on account of unhealthy lifestyles and faulty diet. According to the report, 60% of all deaths worldwide in 2005 (35 million) resulted from non-communicable diseases and accounted for 44% of premature deaths. What's worse, around 80% of these deaths will occur in low and middle-income countries like India which are also crippled by an ever increasing burden of infectious diseases, poor maternal and perinatal conditions and nutritional deficiencies. According to a survey conducted by the Associated Chamber of Commerce and Industry (ASSOC-HAM), 68% of working women in the age bracket of 21-52 years were found to be afflicted with lifestyle ailments such as obesity, depression, chronic backache, diabetes and hypertension.

Yoga is the science of life and the art of living. It is the common sense answer to overall physical and mental fitness. Basically Yoga is a system of physical and mental self improvement and final liberation that people have been using for thousands of years.

Yoga arose in the age of the Vedas and Upanishads. It is India's oldest scientific, perfect spiritual discipline. Yoga is a method of training the mind and developing its power of

subtle perceptions so that man may discover for himself the spiritual truths on which religion, beliefs and moral values finally rest. It is realization of our hidden powers. Swami Shivananda said, "He who radiates good, divine thoughts does immense good unto himself and to the world also". Yoga is science of life, it offers us simple, easy remedies and techniques and methods of health and hygiene to assure physical and mental fitness with a minimum of time, effort and expense.

Yoga in other term Preksha Dhyana invented by prominent Jainacharya Mahaprajna is such an uncomplicated, easy to learn technique of meditation. It comprised of the following

- i. Kayotsarga (Total relaxation)
- ii. Antaryatra (Internal trip)
- iii. Svash preksha (Perception of breath)
- iv. Sharir preksha (Perception of body)
- v. Chaitnya-kendra preksha (Perception of psychic centers)
- vi. Leshya dhyana (Perception of psychic spectrum)
- vii. Perception of the present moment
- viii. Perception of thoughts
- ix. Self-discipline
- x. Bhavana (counter-vibrations)
- xi. Anupreksha (contemplation)
- xii. Concentration.

Yoga is one of the most ancient metaphysical sciences, which investigates the nature of soul and, through its discipline, awakens the super-conscious mind of the man which unites the moral being with the immortal supreme spirit. Yoga leads to balance and also provides both a philosophy and a religion. The real joy of life appears when we can unify nature and culture, wealth and poverty, movement and stillness, attachment and detachment. Yoga can serve both the individual and society. Yoga is neither a sect nor an ideology but a practical training of mind and body. Broadly speaking, it has three main outcomes : it makes us more aware of our natural wisdom, it strengthens the body's ability to recover from illness or injury; it teaches us how to co-operate with others.

Yoga teaches us truth through mind and body rather than theory, it brings about deep change of attitude. The entire thrust of our life is to devote total attention to every action and, at the same time, to trust in the power of sacred.

### **1. Health management through Yoga positions (Asanas)**

Yoga poses have been developed over centuries of research and experience. They have been found to be extremely effective. We should adopt Yoga positions and preferably Yoga routine in our life. Yoga results in huge benefit in terms of :

(i) Correcting metabolic disorders.

(ii) Overcoming stress and mind behaviours that seem beyond our control.

(iii) Changing firmly entrenched attitudes or personality disorders. Integral Yoga ensures all round personality and health development by concentrating on Yoga positions, meditation, pranayam techniques and body cleansing methods.

Yoga has simple and effective body movements that strengthen our back, firm the stomach and redistribute body weight. Yoga exercises stretch and tone the body muscles. To increase endurance and improve flexibility, Yoga asanas or positions are the best among all exercises for toning muscles, lubricating joints and massaging the body. Yoga postures bring physical as well as mental stability. These asanas were developed thousands of years ago and have evolved over centuries. They work wonders in keeping the body healthy and the mind peaceful. Asanas exercise the nerves, glands, ligaments and muscles. In other words, Yoga exercises are the most comprehensive method of self care. Although the asanas are very powerful, the effect becomes dramatic when they are done the right way.

The science of yoga is an ancient one. It is a rich heritage of our culture. Several older books make a mention of the usefulness of yoga in the treatment of certain diseases and preservation of health in normal individuals. The effect of yogic practices on the management of diabetes has not been investigated well. We carried out well designed studies in normal individuals and those with diabetes to assess the role of yogic practices on glycaemic control, insulin kinetics, body composition exercise tolerance and various co-morbidities like hypertension and dyslipidemia. These studies were both short term and long-term. These studies have confirmed the useful role of yoga in the control of diabetes mellitus. Fasting and postprandial blood glucose levels came down significantly. Good glycaemic status can be maintained for long periods of time. There was a lowering of drug requirement and the incidence of acute complications like infection and ketosis was significantly reduced. There were significant changes in the insulin kinetics and those of counter-regulatory hormones like cortisol.

There was a decrease in free fatty acids. There was an increase in lean body mass and decrease in body fat percentage. The number of insulin receptors was also increased. There was an improvement in insulin sensitivity and decline in insulin resistance. All these suggest that yogic practices have a role even in the prevention of diabetes. There is a beneficial effect on the Yoga means to “yoke” to “unite” to bind to “link” to connect or to “merge”. As yoke joins two bulls together, the yoga unites body and mind together. The merger of soul with God, and the experience of oneness with him is yoga. It is possible only through the control over sense organs and through continued practice and detachment.

According to the great Sage Patanjali the withdrawal of sense organs from their worldly objects and their control is yoga.

The aim of man’s life is to get rid of the worries, anxieties and sufferings of the world and to achieve peace and bliss. To get rid of the tempting delusions, sorrows and pains of the world, there are different paths of yoga namely Bhakti yoga, Karma yoga, Dhyana yoga, Jnana yoga, Hatha yoga and other yogas. The paths may be different but the ultimate aim is the same. Our body has been called the temple of the God. According to Shankracharya we can see the image of God in our own body if maintained purity and free from disease. Just as spotless mirror gives clear reflection, the body and mind if maintained purity and health can lead up to success.

Yoga is a science of physical and mental control. It is a system of self renewal of mind and body. It is a means of acquiring a slim supple and healthy body. It can be a way to achieve inner tranquility. It is also a path to great spiritual attainment. Our ancient Rishis and sages have given eight stages of yoga.

They are Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana and Samadhi.

## **1.1 Asana (Posture)**

The first physical aspect and third stage in Ashtanga yoga is asana. Any posture that is performed steadily with ease is called asana. Asanas are for the control of body and mind, purification of our mind, veins and nerves and promotion of general health of the body. Asana tone up the internal and external organs of the body and give energy, vigor and vitality. There are several types of Asanas which include standing, sitting, prone, supine and advanced Asanas.

In Patanjali's yoga, Asana does not mean a specific posture. It means mainly sitting for meditation. Asana means a meditative seat. Asana is maintaining a long time of paramount importance to facilitate proper meditation. The whole science of yoga is only to prepare the person for meditation physically, vitally and mentally.

Patanjali's yoga defines asana as namely "Sthiram Sukham Asanam". Therefore asana in Raja yoga does not imply the different postures of the Hatha yoga. They say that there are 84 Lakhs of different postures. The beloved and worshipful Gurudev Swami Sivanandaji has made it clear that out of these 84 lakhs postures, only 84 are the most important Asanas.

## **1.2 Pranayama (Breath control)**

Pranayama means control and regulation of breath. Prana is a Sanskrit word which means vital force. It also signifies of life of breath. Ayana means the control of the Prana so Pranayama means the control of the vital force by concentration regulated breathing. Prana is the vital power or force which is motivating every element on the earth and is the origin of the force of thought. There is a deep affinity between Prana and mental force, between mental force and intellect, between intellect and soul, and between soul and God. The Prana not only

ensures the proper functioning of the body but is also the regulator and animator of the Psyche. It is a remedy for several physical and psychic disturbances of which modern man is the victim.

In all forms of life from the highest to the lowest the Prana is present as a living force. All the force is based on Prana; it is the origin of movement, gravity, magnetism, physical action, the nerve currents and the force of the thought. Without Prana there can be no life, for it is the soul of all force and energy. It is found in the air, water and food. Prana is the vital force inside each living being and thought is the highest and most refined action of Prana. As we breathe, the movement of the lungs inhaling air is the expression of Prana. Pranayama is not simply the breathing but the control of the muscular force activating the lungs. The control of Prana through the concentration of thought and regular breathing is called pranayama. It is through

Pranayama that each part of body can be filled with Prana. Once one is capable of performing it, one is master of the body and can dominate illness and suffering. Prana is accumulated where our mind is concentrated

Thought is the absolute master controlling Prana energy. Just as we are able to make ourselves ill and weak by thinking wrong and negative thoughts, so we may cure ourselves by expelling bad thoughts and replacing them with positive ones. It is the essential factor in our lives. It is a basic necessity for the safeguard of our health.

As wind drives smoke and impurities from the atmosphere, Pranayama drives away the impurities of the body and mind.

### **1.2.1 Types of Pranayama**

Many types of Pranayama are used in yoga practice such as Surya Bhedana Pranayama, Sheetkari Pranayama, Bhastrika Pranayama, Moorcha Pranayama, Samavrtti Pranayama, Plavini Pranayama, Ujjayi Pranayama, Sheetali Pranayama, Bharmari Pranayama, Kapalabhaati pranayama and Nadisodhana Pranayama.

### **1.3 Yoga is a scientific way to Health**

Yoga is a systematic and methodical process to control and develop the mind and body to attain good health, balance of mind and self-realization. Though yoga has the potential power to make us healthy added to our vigor, still most people lack the knowledge of systematic practice of yoga. They perform yogic exercises for a short period and when their health improves, they discontinue the yoga practice. For this reason, the effective results of yogic practices cannot be determined perfectly.

Many scientists, doctors, psychologists etc, all over the world are extensively studying the beneficial aspects of yoga which encourages us to attain positive health through yoga.

#### **1.3.1 Effects of Yogasanas on Health**

Yogasanas are very effective in throwing out all our body wastes and bring control over the body and organs are proper functioning of which depends our health and happiness. The Asanas improve mental power and health in controlling the sense organs. It increases the elasticity of our body and makes the body more active and supple. The blood circulation takes place more smoothly and properly and the body becomes capable of more work. It improves our resistance power against diseases and do not allow any external matter to accumulate in the body, they keep the body free from diseases. The different asanas clean the blood circulation, drain of our body and circulates blood freely to all parts of our body and

helps keep our body free from impurities. Yogasanas are the best means to keep organs in proper functioning order.

It is not only improving body health, but also have sobering effects on the mind. The mind becomes balance and peaceful. The practice of Yogasanas is very effective activating on various glands, so that they secrete their juices in the required quantity and function properly.

### **1.4 Naturopathy**

Naturopathy is the drugless system of medicine, which relies upon the natural sources in the treatment of diseases rather than the drugs.

Naturopathy is a system of medicine to diagnose, treat and prescribe for any human disease, pain injury, deformity for any physical, chemical or mental condition through the use of air, light, water, heat & all natural methods and modalities. These corrective and orthopedic gymnastics, psychotherapy, hydrotherapy and mineral baths, electrotherapy, heliotherapy, phototherapy, chromotherapy and other stimulation of the sympathetic nervous system through Nutrition and dietetics which is the true healer. All that the physician can do is to remove obstructions and to establish normal conditions within the patient, so that the healing can take place in the therapeutic purposes.

Naturopathy, nature cure, new science of healing, drugless healing, healing from within are more or less similar and related terms. In general Naturopathy or nature cure is a mode of healing which may be called a science rather a science cum art. It investigates in scientific ways all the methods and procedure, which includes the correction of human illness and the maintenance of sound health. It is the practical realization and application of all that is good and sensible in all the systems of therapeutics.

Hippocrates – Father of medicine

He existed in the 5th century. Naturopathy was evolved in German.

In fact, Nature cure is a way of life of which we find a number of references in the Vedas and other ancient texts. The morbid matter theory, concept of vital force and other concepts upon which Nature cure is based are available in old texts which indicate that these methods were widely practiced in ancient India.

Naturopathy is not the invention of any one human mind. It does not takes its origin date, but it is the accumulation of knowledge pertaining to the natural methods of living and healing through the centuries.

The history of nature cure is as old as the origin of man all living beings including animals know and practice nature cure by instance. A sick dog will automatically fast, cats and similar animals know the importance of sunbath. In ancient days very few disease were found compared with the disease found in civilized societies. This was because they were living more naturally.

#### **1.4.1 Health management through Naturopathy**

Diabetes a very old disease, has a common feature excessive accumulation of sugar in blood, due to malfunctioning of pancreas. The general prevalent method of treating the diabetic patient is to inject insulin to compensate what could be produced by the pancreas. The yogic treatment restores the normal functioning of the pancreas and other endocrine glands. The chemistry of the body becomes normal leading to a healthy body.

Nature cure

Routine-enema, mudpack

Specific-full massage, partial massage to abdomen, cold abdomen pack, cold hip bath

### **1.4.2 Principles of Nature Cure**

Nature cure is a constructive methods of treatment which aims at removing the basic cure of disease through the rational use of the elements freely available in nature. It is not only a system of healing, but also a way of life, in tune with the vital forces or natural elements, comprising the human body. It is a complete revolution in the art and science of living.

Nature cure is based on the realization that man is born healthy and strong and that he can stay as such by living in accordance with the laws of nature even if born with some inherited affliction, the individual can cruminate it by putting to best use of the natural agency of healing. Fresh air, sunshine, a proper diet, exercise, scientific relaxation, constructive thinking and the right mental attitude along with prayers and meditation all play their part in keeping a sound mind in a sound body.

Nature cure believes that disease is an abnormal condition of the body resulting from the violation of the natural law. Every such violation has repercussions on the human system in the form of

1. Lowered vitality
2. Abnormal composition of blood lymph
3. The accumulation of the waste matter and toxins

Thus through the faulty diet, it is not the digestive system alone which is adversely affected. When toxins accumulate other organs such as the large intestines, kidneys, skin and lungs are over worked and cannot get rid of these harmful substances quickly as they are produced.

Besides their mental and emotional disturbances, it also causes imbalances of vital electric field within which cell metabolism takes place producing toxins. When this electric field is undisturbed, disease causing germs can live in it without multiplying or producing toxins. It is only when it is disturbed or when the blood is polluted with toxic wastes that the germs multiply and become harmful.

### **1.4.3 Fundamental Principles of Nature Cure**

The whole philosophy and practice of nature cure is built on three basic principles.

#### **i. All Diseases are due to One cause (Universal Basic Cause of Disease)**

The first and most basic principle of nature cure is that all forms of diseases are due to same cause, namely the accumulation of waste materials and bodily refuse in the system. These waste materials from a healthy individual are person, they are steadily piling up in the body through years of faulty habits of living such as wrong feeding, improper cure of body and habits contributing to innervation and nervous exhaustion such as worry, over work and exercise of all kinds. It follows from this basic principle that the only way to cure disease is to employ methods which will enable the system to throw off these toxic accumulations. All natural treatment excess of the capacity of the organs to deal with, it leads to clogging of the system which becomes highly toxic and called "auto-intoxication" or "Toxemia" which is the fundamental cause of all future ill health.

**ii. All Acute Diseases are nothing but the Healing or Cleansing efforts of the body.**

The second basic principle of nature cure is that all acute disease such as fever, common cold, inflammations, digestive disturbances and skin eruptions as the self initiated efforts of the body to throw off the accumulated waste material Nature Cure believes that all chronic diseases, such as cardiac diseases, diabetes Rheumatism, asthma, kidney disorders etc., are the results of suppression of the acute diseases through harmful methods such as drugs, vaccines, narcotics etc.,

**iii. The Body has its own Healing Power or Recuperative over**

The third principle of nature cure is that the body contains elaborate healing mechanism which has the power to bring about a return to norm condition of health, provided right methods are employed to enable it to do so. Other words, the power to cure disease lies within the body itself and not in hands the doctor.

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Nature Cure believes that all the diseases arise due to accumulation of morbid matter in the body and if scope is given for its removal, it provides cure or relief. It also believes that the human body possess inherent self constructing and self healing powers. The fundamental difference in Nature Cure with other systems is that its theory and practice are based on holistic view point whereas the latter's approach specific treatment but takes into account the

totality of factors responsible for diseases such as one's un-natural habits in living, thinking, working, sleeping, relaxation, sexual indulgence etc, and also considers the environmental factors involved which on the whole disturbs the normal functioning of the body and lead it to a morbid, weak and toxic state. For treatment it primarily stresses on correcting all the factors involved and allowing the body to recover itself. A nature cure physician helps in Nature's effort to overcome disease by applying correct natural modalities and controlling the natural forces to work within safe limits. The five main modalities of treatment are air, water, heat, mud and space.

The Five great elements of nature and the treatments based on them are:

- 1 Earth – Mud baths, Mud packs,
- 2 Water – Hydrotherapeutic methods in the form of Baths, Jets, Douches, Packs, Compresses, Immersions
- 3 Air –Breathing exercises, Outdoor walking, Open air baths
- 4 Fire – Sun baths, Thermoleum baths, Magnetized water, Color charged oils/water
- 5 Ether – Fasting therapy

### **1.5 Diabetes and Naturopathy**

Diet therapy: This therapy is not only given to regulate blood sugar levels but a patient is also prescribed certain juices are to help improve the disorder.

Hydrotherapy In this form of therapy a combination of baths, packs and warm water enema are given as a remedy. Hydrotherapy helps improve a person's metabolism and

controls blood sugar levels, enhances the body's capability to use glucose and the enema helps cleanse toxins from the colon, detoxify the system. Hydrotherapy drastically improves the metabolic rate and brings the sugar level under check.

In this warm water enema is given which cleanses and detoxify the body of accumulated toxins. Plays a vital role in improving the metabolic rate and controlling the blood sugar level. A warm water enema cleanses the accumulated toxins from the colon, thereby detoxifies the system. Other treatments include Hip bath, immersion bath, Foot and Arm bath, steam bath, Gastro hepatic pack, hot and cold compress over abdomen, abdomen pack etc. These treatments enhance the capability of the muscles to utilize the blood sugar and increase blood flow to the muscles and provide better sleep.

Mud therapy helps to correct the imbalance of the digestive and endocrinal organs, which remain under -active in diabetic patients resulting in accumulation of toxins. Full Mud bath is the best way to eliminating the toxins. Direct mud or mud pack on the abdomen are also found beneficial in this treatment. It increases the circulation, relieves inner congestion and elimination of morbid matter.

Mud bath is one of the best methods to eliminate the toxins from the body. In this mud pack is applied on the abdomen increases the blood circulation, relieves inner congestion and eliminates morbid toxins from the body.

## **1.6 Diabetes mellitus**

Diabetes mellitus is a multi system disease related to abnormal insulin production impaired insulin utilization or both. Diabetes mellitus is a serious breath problem throughout the world.

### **1.6.1 Genesis of Diabetes Mellitus**

Diabetes is a constantly growing health problem in all over the world today. Diabetes mellitus has been clinically identified as a disorder / health hazard.

The first written record of diabetes was discovered on an ancient Egyptian papyrus dated back to 1500 BC, which describe excessive urination, polyuria, one of the main symptoms of diabetes. The Indian text Susruta, written in approximately 400 BC, notes the diseases and calls it madhu meh, honey in the urine. In the west, Willis first noticed the disease and was characterized by sweetness of the urine in 1675 AD. Today there is an estimation that approximately 9% of the populations have diabetes. The number of cases is said to be rising 6% each year.

The disease is not just a case of having too much sugar in the blood; it affects nearly every organ in the body. An estimated 300,000 people die from diabetes and its complications such as heart attack, stroke and kidney failure. It is also the leading cause of blindness in America, as well as causing high blood pressure, impotence, gangrene and chronic infections, which often necessitate amputation. After cancer and heart disease, diabetes is the third most common cause of death in America. The American Diabetes Association has used a poster requesting funds for research with the slogan: "Every 60 seconds another American is diagnosed as diabetic".

Diabetes mellitus is not modern disease. In 1500 B.C. Papyrus of ancient Egyptians recorded a number of remedies for passing urine. In 1000 B.C itself Indian physician Sushurutha diagnosed diabetes. In 1978, J. John, the Greek physician found diabetes is associated with excess of glucose in blood. Discovery of insulin by Banting and but in 1921 is a landmark in diabetes history.

World diabetes day is the major global awareness campaign for patient with diabetes day was introduced in 1991, celebrated on 14 November each year, to coincide with the birthday of Frederick Banting who along with Charles Best first conceived the idea that led to the discovery of insulin.

The slogan chosen for world diabetes day 2004 is “fight obesity, prevent diabetes”, to highlight the impact lifestyle on health and how to prevent or lessen the effect of diabetes. A healthy lifestyle is the combination of healthy eating and regular exercise with regular physical activity.

In obese, patient with type – 2 diabetes the association of hyperglycemia, hyperinsulinaemia, dyslipidaemia and hypertension which leads to coronary artery disease and stroke, may result from an exaggerated by obesity.

Diabetes is an “Iceberg” disease all through increase in both the prevalence and incidence of type, 2 diabetes have occurred globally, they have been especially dramatic in societies in economic transition in newly industrialized countries and developing countries currently the number causes of diabetes worldwide is estimated to be around 15 million. This number is predicted to double by 2025, with the greatest number of cases being expected in china and India.

In 2000, according to the World Health Organization, at least 171 million people worldwide suffer from diabetes, or 2.8% of the population. Its incidence is increasing rapidly, and it is estimated that by 2030, this number will almost double For at least 20 years, diabetes rates in North America have been increasing substantially. In 2010 nearly 26 million people

have diabetes in the United States alone, from those 7 million people remain undiagnosed. Another 57 million people are estimated to have pre-diabetes.

According to the American Diabetes Association, approximately 18.3% (8.6 million) of Americans age 60 and older have diabetes. Diabetes mellitus prevalence increases with age, and the numbers of older persons with diabetes are expected to grow as the elderly population increases in number. The National Health and Nutrition.

Examination Survey (NHANES III) demonstrated that, in the population over 65 years old, 18% to 20% have diabetes, with 40% having either diabetes or its precursor form of impaired glucose tolerance.

India has a high prevalence of diabetes mellitus and the numbers are increasing at an alarming rate. In India alone, diabetes is expected to increase from 40.6 million in 2006 to 79.4 million by 2030. Studies have shown that the prevalence of diabetes in urban Indian adults is about 12.1%, the onset of which is about a decade earlier than their western counterparts and the prevalence of Type 2 diabetes is 4-6 times higher in urban than in rural areas.

The overall incidence of diabetes was 20.2 per 1000 person years of follow up while the overall incidence of pre-diabetes was 13.1 per 1000 person years of follow up.

The racing prevalence of diabetes in developing countries is closely associated with industrialization and socio economic development it is estimated that 20% of the current global diabetic population resides in the south East Asian region. The number of a diabetic person in the countries of the Region is likely to triple by the year 2025, increasing from the present estimates of about 30 million to 80 million.

An analysis of age specific prevalence rates of diabetes mellitus consistently showed an increase in prevalence with increasing age .in the region the proportion of people in the age group 30years and above will increase from 37.2% in 1995-41.9 in 2025. There will be a corresponding increase in the proportion of diabetes in old age group .The percentage of diabetes case crusading in urban areas is projected to increase participation in modern exercise.

### **1.6.2 Classification of Diabetes**

The classification adopted by World Health Organisation is given in clinical classification of diabetes mellitus.

#### 1. Diabetes mellitus (DM)

i) Insulin – dependent diabetes mellitus (IDDM, Type I)

ii) Non – insulin dependent diabetes mellitus (NIDDM, Type II)

iii) Malnutrition – related diabetes mellitus (MRDM)

iv) Other types (secondary to pancreatic, hormonal drug – induced,

Genetic and other abnormalities)

#### 2. Impaired glucose tolerance (IGT)

#### 3. Gestational diabetes mellitus (GDM)

Thus, diabetes has been mainly classified clinically as IDDM (Insulin Dependent Diabetes Mellitus) and NIDDM Non-Insulin Dependent Diabetes Mellitus). In fact IDDM is usually originated either in childhood or in adolescence and NIDDM is seen in adults.

The complications are developed due to continue elevation of blood glucose, which damages the blood vessels, heart, kidney, nervous system and even the eyes. The associated classical symptoms are frequent urination, excess hunger, weight loss, thirst, fatigue, weakness etcetera. Moreover, the IDDM patients are prone to ketoacidosis whereas NIDDM is associated with infection or stress ketosis.

The economic impact of an increasing incidence of diabetes and the cost involved in treating it and its complications is considerably high. Diabetes affects an estimated 40 million people, greatly increasing the risk of premature death and disabling complications. The management of Type II (NIDDM) diabetes imposes an enormous burden on health care professionals. Fortunately, the pathogenic factors, which cause high blood sugar, can be controlled by exercise, diet, oral anti-diabetic drugs and, in a few instances, in combination with insulin. No oral anti-diabetic drug causes complications when used under medical supervision. With the onset of complications, insulin is desirable to prevent a worsening of the disease.

### **1.6.3 Cause Unknown**

Since 1921 the discovery of insulin has saved millions of lives. However, even though the disease is one of the earliest recorded in history and despite the fact that hundreds of millions of dollar are being poured into its research all over the world, it is still poorly understood and remains the cause of untold suffering, disability and premature mortality.

Since the early pioneering work of Minkowski and the classical studies of Banting and Best, the intimate relationship between the secretion of insulin from the pancreas and clinical diabetes mellitus has been well established. However, insulin deficiency is not always the primary factor responsible for diabetes. Today there is good deal of contention as to the exact mechanism involved. For example, some people have found altered tissue responsiveness to a normal amount of blood insulin, circulating insulin antagonists (chemicals which act against insulin), abnormalities in insulin binding probably some truth in all these factors.

It appears, therefore that in diabetes one of two things can happen: either run out of insulin, now called Type I insulin dependent diabetes, or something goes wrong with the insulin glucose metabolism so that insulin is available but comes too late and does not work properly. This is called Type II diabetes, not dependent on insulin.

The diabetes situation is complicated and difficult to research because sugar metabolism is so basic, all-pervasive, essential and complex. We do know that poor diet sedentary lifestyle, obesity and mental tension are related factors, but what really goes on and how to cure it is still unknown.

#### **1.6.4 Glucose metabolism**

Apart from oxygen, glucose is the most important energy source in the body and is required to maintain the life and the proper function of every cell in the body. When we eat glucose, it is transported to all the various tissues of the body as fuel and also is stored for later use. The liver, pancreas and adrenal glands are the main body organs responsible for regulating sugar metabolism.

Storage of glucose and entry of glucose into the cells of the body requires insulin. When glucose enters the body, it triggers the release of insulin from the beta cells of the islets of Langerhans in the pancreas. Insulin opens the door for glucose to enter the liver, fat and muscle cells, where it will be stored and used. Storage the job of the liver and fat cells is important because glucose is our most precious fuel, without which the brain and body cannot function. However, if we run out of insulin, no matter how much sugar we have available in the bloodstream, it is useless because there is no insulin to push glucose into the cells where it is needed.

Glucagon is a hormone that is released from the alpha cells of the islets of Langerhans and works opposite to insulin. It is released in response to starvation, severe exercise and carbohydrate restriction, so as to release stored glucose.

When we fast, about four or more hours after eating, insulin levels decrease and the liver automatically releases glucose to feed the body, Stress, increased sympathetic nervous system activity and adrenal gland activity, release more glucose into the blood. When we are tense, tired, under some kind of real or imagined threat or doing physical exercise, the sympathetic and adrenal systems release glucose to feed the overactive cells in the body.

The whole question of glucose metabolism is complex, multifactor and interrelated with the workings of the whole body. It is an extremely complicated process but this provides a broad and general outline of how things work.

The physiological parameters includes abnormal thirst, frequent urination, tiredness, sudden weight loss blurred vision.

The psychological parameters include stress, anxiety, depression. emotional stress may have a negative impact on diabetic control as well .an increase in stress hormones leads to an increase in glucose levels . Especially when the intake of food and insulin remains unchanged .In addition, during period of emotional stress, the person with diabetes may alter the usual pattern of meals, exercise and medication .Depression is common among people with diabetes and is the most frequently cited psychological disorder associated with diabetes. It is roughly 3 times more prevalent in those with diabetes 15-20% of people.

However, ancient Indian physicians “Charaka” and “Susrutha” have given description of diabetes in their traditional text. They recommended doing physical exercises and ensuring proper diet for the control of diabetes.

Diabetes is one of the major health problems affecting about 5% of Indian population. Complications involved in management of diabetes and increasing prevalence of diabetes every year have been emphasized on the need for efficient control. Diet control, exercises and meditation with insulin and / or antiglycettmic drug are the presently available treatment procedures. Stress management is also important in preventing the onset as well as controlling diabetes. Yoga includes moderate exercise, diet restriction, relaxation techniques etceteras, is a very good stress management system. Yoga brings harmony in body and mind, and keeps the person health, both physically and mentally. Literature survey indicates that effective control of diabetes; both Insulin Dependent Diabetes Mellitus and Non Insulin Dependent Diabetes Mellitus can be achieved by yoga practice, which can be explored by further experimental researches.

### **1.6.5 Diet for Diabetes**

The subject of what diabetics should eat is best dealt with by a dietician. However, from the practical point of view, we have found that are certain foods that are beneficial for

diabetics, especially when combined with a yoga program. It is known that dietary prescription should not be too rigid and should be individualized for the patient's culture, type of disease, etcetera. Diet is more important for non-insulin dependent diabetes than for insulin treated patients in whom any extra stress of the diet is dealt with a little extra insulin.

All nutritionists will agree that for good health a variety of minimally processed foods with lots of fresh nutrients and fiber is best. Research has found that insulin dosage can often be reduced with a high fiber diet, such as whole grains, beans and vegetables-an ashram diet. It is also known that, as diabetics have an increased incidence of heart disease and high blood pressure, moderate weight loss alone combined with exercise will bring about a general improvement. Many people have stopped using anti-diabetic drugs following the combination of a yogic lifestyle and diet.

The diet should be low fat because high fat diets impair carbohydrate metabolism and increase the chances of getting heart disease. The American Diabetic Association recommends a diet in which 60-70% of calories come from carbohydrates, while the rest of the diet should be 20-30% protein and 10-20% fats. Whatever fats are taken into the body should be unsaturated (usually plant and vegetable origin) rather than saturated Fats (animal origin).

As a general dictum for diabetes avoid excess amounts of simple sugars, such as white sugar, honey, glucose and other forms of sweets. Eat more complex carbohydrates such as wheat, oatmeal, buckwheat, corn and wholegrain (unrefined) rice. Also salt intake should be low and alcohol no more than moderate. However, research shows that diabetics may be able to occasionally eat a minimal amount of sugar. It is important to follow your doctor's guidelines in this matter and a good doctor who is up on the latest research will advise you accordingly to your individual needs. However, as a general guideline the following is a good

diabetic and general health diet: Vegetables the following vegetables contain insignificant carbohydrates and calories. As a salad, you can eat as much as you like.

When cooked, the intake should be limited to about one quarter liter of cooked vegetables (boiled, baked or steamed, not fried), e.g. cabbage cauliflower, cucumber, eggplant (brinjal), spinach, okra (lady's fingers), tomato, parwal (gourd), celery, bitter gourd (darela).

Vegetables: each portion contains approximately 14 grams of carbohydrate and four grams of protein (about 80 calories) per measuring cup (1/4 litre), example carrots, onions, green peas.

Fruits: each portion contains 10 grams of carbohydrate (approximately 40 calories) For each item mentioned: one orange, one Guava, 1/3 papaya, 1/2 apple, 1/2 banana, and one cup water melon.

Cereals: each portion contains 25 grams of carbohydrate and two grams of protein (approximately 70 calories) for each item mentioned: two and 1/2 tablespoons of wheat, jawar, millet ( bajara ) or corn flour, 1/2 cup of cooked rice or khichari ( rice cooked with lentils ), 20 grams of nonsweetened biscuits, 100 grams of boiled potato.

Pulses: as a rule, one cup (one portion of cooked dall (pulses). example lentils, mung beans, split peas) contains approximately 140 calories.

Fats: one portion contains five grams of fat (approximately 50 calories) for each item: one teaspoon butter, oil or ghee: 10 grams of cashew nuts, ground nuts or almonds.

This example of a diabetic diet should supply approximately 2000 to 2500 calories per day and should be adjusted to suit your needs and wants by a skilled professional, example you may need more calories during heavy exercise.

When this diet is combined with a yogic sadhana, and once the blood sugar has been controlled by a combination of yoga, diet and medicines as required, the diet can be readjusted. However, this kind of diet is very close to the one used in the ashram and is recommended for most people as a light, balanced diet which should enhance general health and increase the lifespan.

Both patient and doctor should not only be aware of the wide variety of good and tasty foods available to the diabetic, but also that it is the addition of yoga that can transform the life of the patient, increasing awareness of needs and capacity, promoting digestion and metabolism and offering the reward of new health, vitality and higher consciousness.

Diabetes mellitus is a chronic imbalance in the mechanism regulation blood sugar level. When it occurs, the glucose absorbed into the blood from the digestive system is prevented from being effectively used in the muscles and tissues, or from being stored in the liver in the form of glycogen or as fat. It is caused either by a relative or absolute lack of the hormone insulin.

### **1.6.6 Structure of Pancreas**

The pancreas is a rather unique organ in the human body. It is part of two different organ systems, the endocrine system and the digestive system. Technically, the pancreas is a large gland. A gland is a structure in the body that secretes hormones. The pancreas creates a wide range of different hormones, some of which are used to trigger internal metabolic reactions and others which are used to help break down food.

The pancreas is located just below the stomach. It develops as two separate parts which are fused together early in life. The pancreas is also located near the first part of the small intestine, known as the duodenum.

The pancreas is broken into several different subsections. The head of the pancreas is located nearest to the duodenum. The body of the pancreas is the largest section, located in the center of the gland just below the stomach.

The pancreas also has a tail, which is furthest from the duodenum. The pancreas receives its blood supply from various different arteries. These arteries all have very specific names, depending on where they originate from. Nerve supply to the pancreas is primarily through the vague nerve. There is a small duct, or drain, in the pancreas which leads to the common bile duct. This duct is used to drain the execrable hormones which aid in the digestion of food that is passing through the small intestine. In some people, this drain empties directly into the duodenum, however in most people it empties into the common bile duct. The common bile duct is the duct which drains bile from the gallbladder. The enzymes are mixed with bile and then drained into the duodenum.

Another major structure of the pancreas is known as the Islets of Langerhands. These islets are small structures dotted throughout the pancreas, and are responsible for producing insulin, as well as a wide variety of other hormones used by the body. It is estimated that each pancreas contains over one million of these islets.

### **1.6.7 Function of the Pancreas**

The pancreas is involved in a wide variety of functions in the endocrine and exocrine system. Let's first take a look at some of the endocrine functions of the pancreas. An

endocrine hormone is a hormone produced by a gland (such as the pancreas) which is secreted directly into the blood stream. These hormones include insulin, glucagon, and somatostatin. Insulin is famous for being the hormone which is deficient in people with diabetes. People with diabetes do not produce enough insulin.

Insulin is responsible for regulating the amount of sugar which is absorbed into the cells of the body. Without enough insulin, the sugar remains in your bloodstream where it can cause significant health problems.

The pancreas is also an exocrine gland. Exocrine glands do not secrete hormones directly into the bloodstream. Rather, they secrete hormones into organs. In the case of the pancreas, enzymes are produced which are transported to the duodenum. These enzymes are used to aid digestion of food. Some of these hormones include pancreatic lipase, pancreatic amylase, and trypsin.

The pancreas is an extremely important organ in your body. It has a very complex structure and has many functions related to your metabolism. Damage to the pancreas can often be quite significant - hormones and digestive enzymes can be inappropriately released into the surrounding area, causing much damage. As is the case with many organs in the body, the pancreas is also subject to becoming cancerous.

### **1.6.8 The importance of the Pancreas**

It is both an exocrine and endocrine gland. It is responsible for controlling the blood sugar level in the body as well as providing the digestive enzymes for all three categories of food; proteins, fats, and carbohydrates.

### **1.6.9 What happens if pancreas is removed**

If you have part of your pancreas taken out, you will probably still make enough insulin. But your doctor will need to keep a very close eye on if you have part of your pancreas taken out; you will probably still make your blood sugar to make sure you do not develop diabetes. You may not make enough digestive juices, but you can take supplements of pancreatic enzymes when you eat. The supplements come in different forms. Usually capsules that you can swallow or empty onto your food. If you have your pancreas completely removed, you will have to take pancreatic enzyme supplements and insulin. Because you won't be making your own insulin, you will effectively have diabetes. There is a lot to learn at first. But your doctors and nurses will help you until you feel confident.

You have insulin as a small injection under the skin. Before you have an insulin injection, you have to check your blood sugar level so that you know how much to inject. You do this by pricking your finger and squeezing a drop of blood onto a testing strip.

### **1.7 Causes of Diabetes**

Diabetes mellitus occurs when the pancreas doesn't make enough or any of the hormone insulin, or when the insulin produced doesn't work effectively. In diabetes, this causes the level of glucose in the blood to be too high.

In Type 1 diabetes the cells in the pancreas that make insulin are destroyed, causing a severe lack of insulin. This is thought to be the result of the body attacking and destroying its own cells in the pancreas - known as an autoimmune reaction. It's not clear why this happens, but a number of explanations and possible triggers of this reaction have been proposed.

These include:

- Infection with a specific virus or bacteria;
- Exposure to food-borne chemical toxins; and
- Exposure as a very young infant to cow's milk, where an as yet unidentified component of this triggers the autoimmune reaction in the body.

However, these are only hypotheses and are by no means proven causes.

Type II diabetes is believed to develop when

· The receptors on cells in the body that normally respond to the action of insulin fail to be stimulated by it - this is known as insulin resistance. In response to this more insulin may be produced, and this over-production exhausts the insulin-manufacturing cells in the pancreas.

- there is simply insufficient insulin available; and
- the insulin that is available may be abnormal and therefore doesn't work properly.

The following risk factors increase the chances of someone developing Type II diabetes:

- Increasing age;
- Obesity; and
- Physical inactivity.

Rarer causes of diabetes include

- Certain medicines;
- Pregnancy (gestational diabetes) and
- Any illness or disease that damages the pancreas and affects its ability to produce insulin example pancreatitis.

### **1.7.1 Symptoms of Diabetes**

In both types of diabetes, signs and symptoms are more likely to be similar as the blood sugar is high, either due to less or no production of insulin, or insulin resistance. In any case, if there is inadequate glucose in the cells, it is identifiable through certain signs and symptoms. These symptoms are quickly relieved once the Diabetes is treated and also reduce the chances of developing serious health problems.

### **1.8 Diabetes Type I**

In Type I, the pancreas stops producing insulin due to autoimmune response or possibly viral attack on pancreas. In absence of insulin, body cells don't get the required glucose for producing Adenosin Triphosphate units which results into primary symptom in the form of nausea and vomiting. In later stage, which leads to ketoacidosis, the body starts breaking down the muscle tissue and fat for producing energy hence, causing fast weight loss. Dehydration is also usually observed due to electrolyte disturbance. In advanced stages, coma and death is witnessed.

### **1.9 Diabetes Type II**

**Increased fatigue:** Due to inefficiency of the cell to metabolize glucose, reserve fat of body is metabolized to gain energy. When fat is broken down in the body, it uses more

energy as compared to glucose; hence body goes in negative calorie effect, which results in fatigue.

**Polydipsia** : As the concentration of glucose increases in the blood, brain receives signal for diluting it and, in its counteraction we feel thirsty.

**Polyuria**: Increase in urine production is due to excess glucose present in body. Body gets rid of the extra sugar in the blood by excreting it through urine. This leads to dehydration because along with the sugar, a large amount of water is excreted out of the body.

**Polyphagia** : The hormone insulin is also responsible for stimulating hunger. In order to cope up with high sugar levels in blood, body produces insulin which leads to increased hunger.

**Weight fluctuation**: Factors like loss of water (polyuria), glucosuria, metabolism of body fat and protein may lead to weight loss. Few cases may show weight gain due to increased appetite.

**Blurry vision**: Hyperosmolar hyperglycemia nonketotic syndrome is the condition when body fluid is pulled out of tissues including lenses of the eye, which affects its ability to focus, resulting blurry vision.

**Irritability**: It is a sign of high blood sugar because of the inefficient glucose supply to the brain and other body organs, which make us, feel tired and uneasy.

**Infections**: The body gives few signals whenever there is fluctuation in blood sugar (due to suppression of immune system) by frequent skin infections like fungal or bacterial or urinary tract infection.

**Poor wound healing:** High blood sugar resists the flourishing of white blood cell which are responsible for body immune system. When these cells do not function accordingly, wound healing is not at good pace. Secondly, long standing diabetes leads to thickening of blood vessels which affect proper circulation of blood in different body parts.

### **1.10 The components of yoga for diabetics may be as follows**

#### **Asana**

A series of asanas is to be practiced in the treatment of diabetes. These asanas adjust the function of the organs involved by regulating nervous impulses and blood flow to the glandular nervous impulses and blood flow to the glandular areas and by gently massaging all the glands and organs.

#### **Kriya**

Kriya is to be practiced in the treatment of diabetes. This purificatory process adjust the function of the organs involved by regulating nervous impulses and blood flow to the glandular nervous impulses and blood flow to the glandular areas and by gently massaging all the glands and organs.

#### **Pranayama**

Pranayama controls the body's energy, allowing vital forces to flow to those areas that require extra energy. The brain, pancreas and other organs can then be revitalized consciously and systematically.

## **Meditation**

The mind, through the nervous system, controls every action and reaction that occurs in the human body. It keeps a record of everything that a person and his body have undergone in the past and relates it to the decisions which rule every action that a person makes, whether voluntary or involuntary. This control extends from the unconscious and automatic control of the organs and muscles right up to the decisions that are made with the conscious intellectual mind. Every person's whole existence is based upon the correct function of the nervous system.

The science of yoga holds that the nervous system (and the body that it rules) can be brought under a high degree of control and can be made to operate with the greatest possible degree of efficiency through the practice of meditation. This ancient theory has been bolstered by scientific research done in India, Europe and the United States. The bulk of this research has shown conclusively that the daily practice of meditation brings about harmonious changes in the physical organism.

In regard to diabetes, meditation practices have been shown definitely to help the endocrine glands through relaxation of the sympathetic nervous system arising from practices such as ajapa japa. Regulation of the anterior pituitary hormones, which are under the direct control of the hypothalamus, is greatly affected by yoga nidra. Also, a general increase in mental efficiency is brought about.

An estimated 30 million persons in the South-East Asia region are affected at present. It is estimated that by the year 2025 there will be nearly 80 million diabetes in this region. The highest among World Health Organization regions. In addition, in non-insulin dependent diabetes, which is rather silent, chronic, often unidentified killer most of among the adult

population. Of the estimated 27,000 death of diabetic children aged 2-14 years world wide in 1990, almost 45 percent (12,000) occurred in India alone.

### **1.11 Yogic Management of Diabetes**

Yogasana is ideally suited for both types of Diabetes Mellitus. In Insulin Dependent diabetes Mellitus, asanas help to prevent an increase in insulin required over the years. In NIDDM, asanas help to normalize blood sugar due to the high intensity workout. Yogic exercises can either be of high or low intensity, depending on the clinical condition. Young active diabetics can be made to practice very intense asanas in a dynamic manner, which will increase the cellular activity of the muscle, which needs more sugar. The advanced asanas require a lot of energy and this helps normalize blood sugar but, if the person is obese, asana practice is difficult and it is easier to reduce weight by other means and then take up Yoga.

The single advantage of the asana system is that the internal organs, which are directly affected by the geometric shape of the asana itself. Even an elderly diabetic can practice it without any danger.

The force of arterial flow can be increased and directed to any organ, which is of immense use in the diabetic state. In standing poses, the skeletal muscles increase their uptake of sugar. Hence, the tissues retain insulin sensitivity. Capillary changes are easily prevented by Yoga as the action is on the vessel wall.

Yoga is microcellular in its action. At the internal organs are massaged, sensitivity to insulin and uptake of sugar are enhanced. Twisting poses squeeze the intestines and massage them. Hence, stagnation of colonic contents due to autonomic dysfunction cannot occur. Asanas also pressurize the pancreas in an effort to improve the secretory status. The massage

of the pancreas by forward bends and twisting helps to release more insulin in response to food.

Backward bends, being very strenuous, help to reduce blood sugar. Backbends improve blood supply to all abdominal and pelvic organs. This ensures healthy cellular integrity and due to the massage no deposit are formed. Forward bends increase the gastric fire and help healthy digestion of food. This prevents fluctuations of sugar levels in a diabetic. Burning up of excess sugar is promoted by the stimulation of gastric fire.

Pranayama definitely increase the natural immunity of body and vital capacity of lungs. Pranayama is highly valuable for improving oxygen perfusion to tissues. As it also removes stress on the system, progression of blockage is arrested. Oxygen delivery to the tissue is systematic and sure. Tissue hypoxia never occurs. Sympathetic and parasympathetic stabilization prevent autonomic dysfunction. It is very useful for all complication of the diabetic state particularly cardiac autonomic dysfunction, retinopathy and peripheral arterial occlusive conditions.

## **1.12 NEED FOR THE STUDY**

Diabetes mellitus is a chronic disease with which the patient must live his life .To achieve a state of health and acceptable level of function, patient with diabetes mellitus need to have adequate knowledge and attitude of self-care activities. They need to clear their doubts related to self-care activities such as diet ,exercise, medication ,self administration of insulin, foot care and follow up .To lead an independent life ,the diabetic individuals should be a controller of his own life.

It is estimated 30 people in India are affected by diabetes and India is the country with highest rate of diabetes .the who estimated the India would be the home for 57 million diabetes by 2025.

As of 2000 at least 171 million people worldwide suffer from diabetes, or 2.8% of the population. Type 2 diabetes is by far the most common, affecting 90 to 95% of the U.S. diabetes population.

Globally the estimated diabetes prevalence for 2010 is 285 million and is expected to affect 438 million people by 2030. The International Diabetes Federation (IDF) estimates that in 2010 the five countries with the largest numbers of people with diabetes are India, China, the United States, Russia and Brazil. The IDF also reported that in 2010 the five countries with the highest diabetes prevalence in the adult population are Nauru, the United Arab Emirates, Saudi Arabia, Mauritius and Bahrain. Low and middle income countries face the greatest burden of diabetes.

Since 1996 the number of people diagnosed with diabetes has increased from 1.4 Million to 2.6 million. By 2025 it is estimated that over four million people will have diabetes. Most of these cases will be Type 2 diabetes.

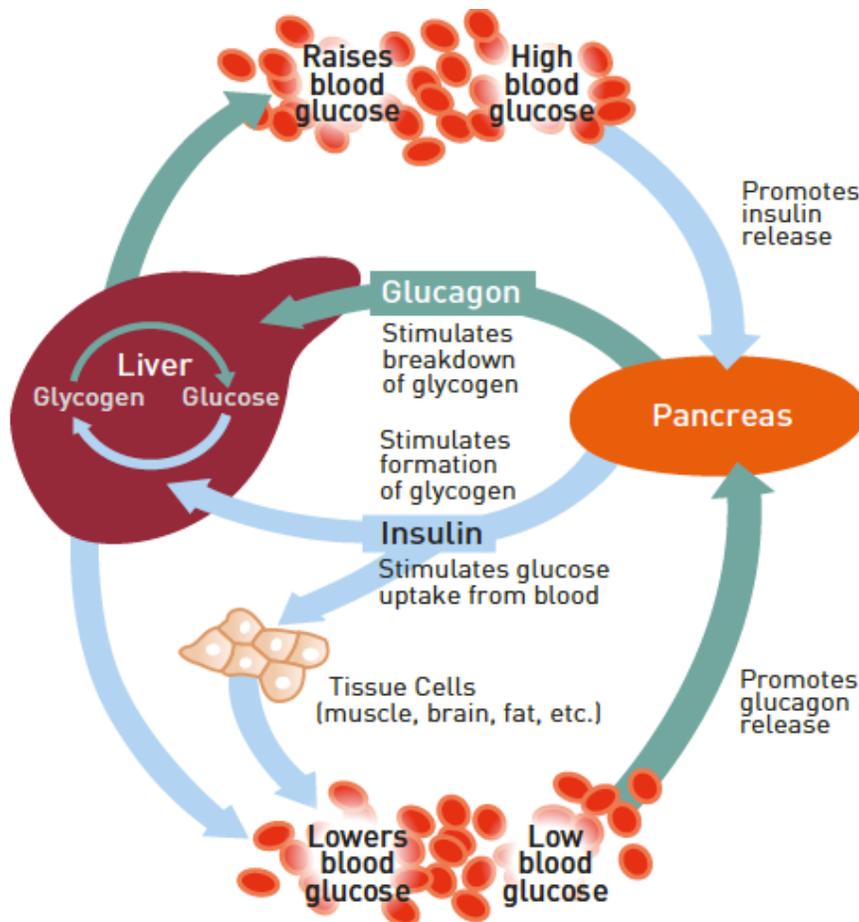
Worldwide, 3.2 million deaths are attributable to diabetes every year. One in 20 deaths is attributable to diabetes; 8,700 deaths every day; six deaths every minute. At least one in ten deaths among adults between 35 and 64 years old is attributable to diabetes. Three-quarters of the deaths among people with diabetes aged under 35 years are due to their condition.

The population in India is an increased susceptibility to diabetes mellitus. The prevalence of diabetes in adults was found to be 2.4 in rural and 4.0-11.6% in urban dwellers.

High frequencies of impaired glucose tolerance shown by those studies ranging from 3.6-9.1% indicates the potential for further rise in prevalence of diabetes mellitus in the coming decades.

The continued presence of troubling symptoms of diabetes mellitus are hyperglycemia hypoglycemia, Fatigue, Polyuria, Polydipsia, blurred vision, stress, anxiety, depression. The stress management strategies includes exercise, Yoga, health education on dietary management, lifestyle modification, self monitoring of blood glucose and self administration of insulin to decrease fatigue, to maintain normal glucose level and to prevent stress among patient with diabetes mellitus.

A similar finding was reported in the Mayor (2012) study where Mayor summarized the potential beneficial impact of following IDF recommendations in the management of diabetes (2012). Mayor (2012) rated IDF as a significant positive influence in drawing the attention of global policy makers on the incidence and steps required to control the growth rate of diabetes. The IDF (2013) has explained the physiology and anatomic process that lead to risk of comorbidities in diabetes in the figure below.



*Fig - 1*

Pathology and physiology of diabetes. From Global Diabetes Atlas (6th ed.), by the International Diabetes Federation, 2013.

Exercise in diabetics: Physical activity is an important part of the diabetes management plan during exercise the muscle use glucose for energy. Regular exercise improves response to insulin. This will helps to reduce the blood sugar level. It helps to control weight.

Walking is the most popular form of exercise, especially among women and older adults, but less than 25% of the US population walks at least 30 min/d has been associated

with a 30% to 40% reduction in risk of type 2 diabetes mellitus. Whether the benefits of regular walking can be extended to patients who already have diabetes is less well studied.

Yoga and other kinds of meditative physical activity may do some measurable good against stress. Researcher Janice Kiecolt-Glaser of Ohio State University found signs of this when she compared 50 women – experts and beginners in yoga. Kiecolt-Glaser was looking at blood chemicals such as interleukin-6 that are associated with stress – and with risks of conditions such as heart disease and diabetes.

Regular practice of yoga reduces the risk of diabetes and yoga can even cure diabetes. Doctors all over the world recommend diabetes patients to practice yoga. The yoga exercises that suit for diabetics differ from normal healthy yoga. The exercises should be customized for diabetics and it should involve stretching exercises, relaxation exercises and meditation.

### **1.12.1 Yoga and the Stress Response**

Stress has become a common catchword in our society to indicate a host of difficulties, both as cause and effect. The American Academy of Family Physicians has noted that stress related symptoms prompt two-thirds of the office visits to family physicians. Exercise and alternative therapies are now commonly prescribed for stress-related complaints and illness. Even a recent issue of Consumer Reports suggests Yoga for stress relief. Many books and articles claim, as does Dr. Susan Lark, that practicing Yoga will “provide effective relief of anxiety and stress.

Diet management is very important in people with both types of diabetes. Doctors recommend a healthy, balanced diet and efforts to maintain a healthy weight. Some people benefit from meeting with a dietitian to develop an optimal eating plan. In a typical days

meals and snacks, you should have 1500-1800 calories with 60% contribution from the carbohydrate, 20% from fat and 20% from protein.

Life style modification in time changes modification in energy and stamina, modification in activity in body changes is essential and has to maintain to reduce Fatigue and relives stress and anxiety and maintain normal blood glucose level.

A study to assess the effectiveness of mindful based intervention to reduce emotional distress in outpatient with diabetes mellitus. Approximately 20-40% of outpatients with diabetes experience elevated levels of emotional distress, varying from disease-specific distress to general symptoms of anxiety and depression. The patient's emotional well-being is related to other unfavorable outcomes, like reduced quality of life, sub-optimal self-care, impaired glycolic control, higher risk of complications, and increased mortality rates. The purpose of this study is to test the effectiveness of a new diabetes-specific, mindfulness-based psychological intervention. First, with regard to reducing emotional distress; second, with respect to improving quality of life, dispositional mindfulness, and self-esteem of patients with diabetes; third, with regard to self-care and clinical outcomes; finally, a potential effect modification by clinical and personality characteristics will be explored.

A considerable proportion of the patients with diabetes (20-40%) experience emotional problems, which vary from disease-specific worries (such as fear of hypo's or worries about complications) to more general symptoms of distress, anxiety and depression. These problems are not only unpleasant for the persons experiencing them, but studies show also that co-morbid emotional distress in patients with DM is associated with reduced quality of life , poor self-care behaviors, more negative appraisals of insulin therapy, reduced glycemic control and subsequent adverse cardiovascular outcomes, and even mortality.

Diabetes patients must become knowledgeable about nutrition, medication effects and side effects, exercise, disease progression, prevention strategies, blood glucose monitoring techniques and medication adjustment. An appreciation for the knowledge and skills that diabetic patients must acquire can help the nurse in providing effective patient education and counseling.

Self monitoring of blood glucose is an important component of modern therapy for diabetes mellitus. Self monitoring of blood glucose has been recommended for patients with diabetes and their health care professionals' in order to achieve a specific level of glycemic control and to prevent hypoglycemia. It can be used to aid in the adjustment of a therapeutic regimen in response to blood glucose value and to help individuals adjust their dietary intake, physical activity and insulin doses to improve glycemic control on a day to day basis.

The investigator during his clinical experience identified that the diagnosis of diabetes created anxiety, stress, fatigue, hyperglycemia, hypoglycemia and other complaints. This motivated the instructor to do a study to evaluate the effectiveness of selective nursing intervention on physiological and psychological parameters among patients with diabetes mellitus.

Naturopathy: A system of living in harmony with the constructive principles of nature on physical, mental, moral, and spiritual planes of living. It has great health-promoting, disease-preventive, curative, and restorative potential. According to the manifesto of the British Naturopathic Association, "Naturopathy is a system of treatment which recognizes the existence of the vital curative force within the body." It therefore advocates aiding the human system to remove the cause of disease (i.e., toxins) by expelling the unwanted and unused

matters from human body for curing diseases (Ministry of Health and Family Welfare, India, 2011).

Yoga: A discipline to improve or develop one's inherent power in a balanced manner. It offers the means to attain complete self-realization. The literal meaning of the Sanskrit word yoga is "yoke." Yoga can therefore be defined as a means of uniting the individual spirit with the universal spirit of God. According to Sage Patanjali (believed to be the first proponent of yoga), yoga is the harnessing of modifications of the mind to create a harmony and union of body, mind, and spirit. Yoga and yogic processes have been used as an effective medium for prevention of disease and treatment of certain kinds of diseases.

### **1.13 OBJECTIVES OF THE STUDY**

1. To find out whether there would be any significant difference in Physiological variables due to Yogic practices and Naturopathy treatment among Diabetes women.
2. To find out whether there would be any significant difference in Biochemical variables due to Yogic practices and Naturopathy treatment among Diabetes women.
3. To find out whether there would be any significant difference in Psychological variables due to Yogic practices and Naturopathy treatment among Diabetes women.

### **1.14 REASONS FOR THE SELECTION OF THE TOPIC**

In the modern days, people are leading in sedentary way of life. As a result they are prone to various diseases and disorders like Diabetes, Obesity, Hypertension, Asthma, Backache, etc. So the investigator would like to create awareness among the people with the Diabetes, by using Yogic practices and Naturopathy treatment as a tool.

### **1.15 REASONS FOR THE SELECTION OF VARIABLES**

The variables like Blood Glucose Level, Fasting Glucose Level, and Postprandial Blood Glucose Level are common in Diabetes. They affect the Activities of Daily Living (ADL) of the patient. So the above mentioned Biochemical variables are taken into account. Physiological variables like Blood pressure and Resting Pulse rate and also psychological variables like Stress and Job Satisfaction play a vital role in determining the health of the individuals. For the same Physiological, Biochemical and Psychological variables are considered for this study.

### **1.16 STATEMENT OF THE PROBLEM**

The purpose of the study was to find out the Influence of yogic practices and Naturopathy practices on selected physiological, Biochemical and psychological variables among Diabetic affected women.

### **1.17 HYPOTHESIS**

1. It was hypothesized that there would be significant difference on Yogic practices (Experimental group - A) and Naturopathy practices (Experimental group - B) than the control group (group – C) on selected Physiological, Biochemical and Psychological variables among Diabetes women.
2. It was hypothesized that there would be significant difference between Yogic practices (Experimental group - A) and Naturopathy practices (Experimental group - B) on selected Physiological, Biochemical and Psychological variables among Diabetes women.

## **1.18 SIGNIFICANCE OF THE STUDY**

1. To find out the exact treatment for Diabetes which is common in present society by comparing Yogic practices as well as Naturopathy practices.
2. To explain the qualities of Physiological, Biochemical and Psychological variables.
3. To create awareness among the disease prone people in the society about the therapeutic values of the Yogic practices and Naturopathy practices.
4. This study may be helpful to the future research scholars to select new problems related to the topic.

## **1.19 DELIMITATIONS**

The following delimitations were taken into consideration in the interpretation of results:

1. The study was confined to women suffering from diabetes mellitus as i.e., assessed by medical diagnosis. only.
2. The age of the subjects was ranged from 35 to 45 years only.
3. The total number of subjects was 90, in which 30 for control group, 30 for group A, and 30 for group B were taken for the study.
4. The subjects were selected from various organizations, hospitals and clinics in Nagercoil town only.
5. The subjects were treated with Yogic practices and Naturopathy practices only.
6. The study was conducted on variables of Fasting Glucose Level, and Postprandial blood glucose level, Blood pressure, Resting Pulse rate, Stress and Job Satisfaction only.

## **1.20 LIMITATIONS**

The followings were the limitations of the study which need to be recognized while interpreting and generalizing the results:

1. Meteorological variations such as air, temperature, atmospheric pressure, relative humidity etceteras during the testing periods were not considered and their possible influence was common for all the different experimental and control groups.
2. The subjects living conditions, lifestyle, diet, personal habits, family, and history was not taken into consideration for this study.
3. The researcher could not control the subjects' routine work, was considered as a drawback of the study.
4. The researcher could not measure certain variables such as functions of brain or the eye- due to paucity of fund.

## **1.21 MEANING AND DEFINITION OF THE TERMS**

### **1.21.1 YOGA**

Yoga as “Chitta vritti nirodhah” – Patanjali’s Yoga Sutra//I.2.

- Cessation of mental modificationsnis yoga.

Yoga as “Samatvam yoga uchyate” – Bhagwadgita II.48.

- Balance / equanimity is called yoga.

Yoga as “Yogah karmasu kaushalam” - Bhagwadgita II.50

- Yoga is skillfulness in action.

### **1.21.2 ASANA**

Asana as “Sthirasukhamasanam”- Patanjali’s Yoga Sutra//II.46.

(Steady and comfortable should be the posture).

### **1.21.3 PRANAYAMA**

“Tasminsati svasaprasvasayorgativichchhdah pranayamah”

- Patanjali’s Yoga Sutra//II.46.

(The asana having been done, pranayama is the cessation of the movement of inhalation and exhalation).

### **1.21.4 DHYANA (Meditation)**

“Tatra pratyayaikatanata dhyanam”

- Patanjali’s Yoga Sutra//III.2.

(Uninterrupted stream of the content of consciousness is Dhyana).

### **1.21.5 NATUROPATHY**

Naturopathy is a system of medicine aimed to diagnose and treat any human ailment. Pain and injury through the use of natural elements – Space, Air, Fire, Water and Earth.

Naturopathic Medicine is a natural approach to health and healing that recognizes the integrity of the whole person.

### **1.21.6 MUD THERAPY**

Mud represents Earth and has tremendous impact on the maintenance of health and prevention of diseases. Minerals and trace elements present in the mud are known for its renowned effects and healing properties. Mud also has the remarkable property of holding moisture for a long time, which has a cooling effect on the part of the body applied.

### **1.21.7 SUNBATH**

Sunbathing is popular for the cosmetic and potential health benefits. In which a person sits or lies in direct sunshine. People often have sunbathe in comfortable places where there is ample sunlight.

### **1.21.8 FASTING**

Fasting is primarily the act of Voluntary abstinence from taking food for definite period of time is called fasting. A fast may be total or partial concerning that from which one fasts, and maybe prolonged or intermittent as to the period of fasting. A complete fast in its traditional definition is abstinence of all food and liquids except for water.

### **1.21.9 BLOOD GLUCOSE LEVEL**

The blood glucose level is the amount of glucose in the blood. Glucose is a sugar that comes from the foods we eat, and it's also formed and stored inside the body. It's the main source of energy for the cells of our body, and it's carried to each cell through the bloodstream.

### **1.21.10 BLOOD PRESSURE**

Blood Pressure is the measurement of pressure of the blood flowing through blood vessels (called arteries) against the vessel walls. Arterial pressure is most commonly measured via a

sphygmomanometer, which historically used the height of a column of mercury to reflect the circulating pressure.

#### **1.21.11 RESTING PULSE RATE**

The time from the end of one contraction to the end of the next contraction is a complete heart beat or pulse or cardiac cycle. The complete cardiac cycle takes less than one second (about 0.08 sec) in a normal adult at rest and it shortened by exercise. (Eva Lurie Weinerb, 1984).

#### **1.21.12 STRESS**

A physical or psychological stimulus that can produce mental tension or physiological reactions that may lead to illness.

#### **1.21.13 JOB SATISFACTION**

"Job satisfaction is defined as "the extent to which people like (satisfaction) or dislike (dissatisfaction) their jobs" (Spector, 1997, p.2). This definition suggests job satisfaction is a general or global affective reaction that individuals hold about their job. While researchers and practitioners most often measure global job satisfaction, there is also interest in measuring different "facets" or "dimensions" of satisfaction. Examination of these facet conditions is often useful for a more careful examination of employee satisfaction with critical job factors. Traditional job satisfaction facets include: coworkers, pay, job conditions, supervision, nature of the work and benefits."