CHAPTER- II

REVIEW OF RELATED LITERATURE

“The literature in any field forms the formation upon which all future work will be built”, Aggarwal (1975).

Several research review on various aspects of Physical Education and Sports have been published. If one or more can be found in the area of research they can be an excellent point for a literature search.

Now-a-days, the educational programme of any type is characterized by reforms and innovative ideas. It seems to be necessary to formulate such a review of various scholars’ work. We bring out a deep insight and clear perspective of the overall field in such reviews.

The research scholar has gone through the available related literatures which are relevant literatures to the present study and have been presented in logical order and sequence of merit.

2.1 STUDIES ON YOGA

Vijayendra Pratap (1971) has done a review of the scientific literature on Yoga which includes comparatives studies not supported by experimental works and studies based on experimental works. Scientific interest supported by experimental studies in this field seems to have been started in 1924 with the foundation of Kaivalyadahama by Swami Kuvalayananda.

In another study Gharote (1962) evaluated Psycho-Physiological effects of selected yogic exercises on the adolescent High School Boys. He
used weigher’s battery Test studying autonomic balance on one hand, and McCurdy Larson organic efficiency test on the other to test the effect of yogic training. He found significant achievement in the autonomic balance shifting of it toward increased Para sympathetic function while encouraging trend was observed in the cardio-respiratory efficiency. A residual effect of this training was also observed even after discontinuing the practice for a period of two months.

Hubert Dhanaraj (1974) also studied the effects of Yoga and the 5 BX fitness plan on selected physiological parameters. The results indicated increase in basal metabolic rate, tidal volume in basal state, T-4 thyroxin, hemoglobin, hematocrired blood cell PWC 130, vital capacity, chest expansion, breath holding time, and flexibility after Yoga training. Decreases in heart rate in barrel state and respiratory rate in barrel state were also observed. When yogic training was discontinued for six weeks, following the six week treatment, a significant declination in the values of PWC 130, flexibility and breath holding time were noticed.

Iyengar (1976) puts forth his views on Asanas thus. “Asanas can be done above as the limbs of the body provide the necessary weights and counter weights. By practicing them one develops ability, balance, endurance and great vitality. Asanas have been evolved all over the countries so as to exercise every muscle, nerve and gland in the body. They serve of fine physique which is strong and elastic without being muscle bond and they keep the body free from disease. They reduce fatigue and free the nerves. But their real importance lies on the way they train and discipline the mind“.
Moorthy (1982) conducted a survey of minimum muscular fitness of school children of age group six to eleven years and compared the influence of selected yogic exercise and physical exercise on them. In that study 1000 children (571 boys and 429 girls) form second standard to seventh standard attended at three schools in Pune.

Ninety boys and Ninety girls were randomly selected for experimental purpose. Thirty boys and thirty girls were randomly allotted to control groups experimental group II. Yogic exercises were undergone on the treatment for a period of six weeks. He concluded that both experimental groups showed significant improvement after six weeks training when compared to control group. The perception of improvement was seen much greater in yogic groups than in physical exercise groups.

Many people consider Asanas as exercise and practice than as an exercise pattern. Keeping their therapeutically use and if Asanas are to be practiced to maintain normal health of mind and body, then, they differ from exercise in many response. While narrating her experience, Indira Devi (1967) has following to say, “The practice of Asanas and deep breathing exercise can be taken by anyone for curing of certain diseases and for keeping better health. They are excellent remedies for nervousness, headaches, constipation, indigestion and insomnia. They restore on men who prematurely lost vigour and the Menstrual of women. They correct irregular functioning of the Heart, Lungs, Stomach, Kidneys and liver provided that no organic defect is at the root of the disease."
Hayes C. (2008) conducted a study during recent years, evidence supporting the vital role of physical activity in the prevention and treatment of diabetes has been accumulating. Physical activity is recognized to produce multiple general and diabetes-specific health benefits. Yet despite the multitude of benefits, many people are physically inactive. As the prevalence of overweight and obesity, prediabetes, and type 2 diabetes has continued to rise at an alarming rate, physical inactivity has become an urgent public health concern. The purpose of this article is to review the physical activity/exercise research in diabetes and summarize the current exercise recommendations. This information can be used by clinicians to make safe and effective recommendations for integrating physical activity/exercise into self-management plans for individuals with diabetes or at risk for its development.

Cha YS (2008) says data on the functionalities of L-carnitine on obesity, diabetes and as an ergogenic aid are summarized as follows:

Obesity: Total lipid, triglyceride and total protein increased during the 3T3-L1 cell differentiation. However, nonesterified carnitine (NEC), acid-soluble acylcarnitine (ASAC) and acid-insoluble acylcarnitine (AIAC) concentrations were lower in the differentiated 3T3-L1 cells. In addition, the exogenously added carnitine inhibited the increases in triglyceride and total lipid levels. In an animal study, L-carnitine supplementation reduced serum leptin and abdominal fat weight caused by high-fat diet in C57BL/6J mice. Diabetes: In an animal study, streptozotocin-induced diabetic rats had markedly lower IGFBP-3 than normal rats, and IGFBP-3 was increased by L-carnitine
treatment, demonstrating that L-carnitine treatment of diabetic rats modulates the IGFs/IGFBPs axis.

Wing RR (2008) says recent research has clearly shown that lifestyle intervention can reduce the risk of diabetes in those with impaired glucose tolerance; weight reduction appears to be the primary determinant of this effect. Weight loss can also improve glycemic control and cardiovascular risk factors in those with diabetes; however, the long-term impact of weight loss on cardiovascular morbidity and mortality is still under investigation. An important finding is that modest weight losses of just 5% to 10% of initial body weight appear sufficient to produce these benefits for diabetes prevention and cardiovascular risk reduction.

Tieu J (2008) says gestational diabetes mellitus (GDM) is a form of diabetes that occurs during pregnancy which can result in significant adverse outcomes for mother and child both in the short and long term. The potential for adverse outcomes, in addition to the increasing prevalence of gestational diabetes worldwide, demonstrates the need to assess strategies, such as dietary advice, that might prevent gestational diabetes. Three trials (107 women) were included in the review. One trial (25 pregnant women) analysed high-fibre diets with no included outcomes showing statistically significant differences. Two trials (82 pregnant women) assessed low glycaemic index (LGI) versus high glycaemic index diets for pregnant women. Women on the LGI diet had fewer large for gestational age infants (one trial; relative risk (RR) 0.09, 95% confidence interval (CI) 0.01 to 0.69), infants with lower ponderal indexes (two trials; weighted mean difference (WMD) -0.18, 95% CI
-0.32 to -0.04, random-effects analysis) and lower maternal fasting glucose levels (two trials; WMD -0.28 mmol/L 95% CI -0.54 to -0.02, random-effects model). Results for women on the LGI diet on neonatal birth weight were not conclusive under a random-effects model (two trials; WMD -527.64 g, 95% CI -1119.20 to 63.92); however, on a fixed-effect model, women on the LGI diet gave birth to lighter babies (two trials; WMD -445.55 g, 95% CI -634.16 to -256.95). High heterogeneity was observed between the trials in most results and both were relatively small trials. One of these trials also included a standard exercise regimen for all participants.

Pandit and Kailash (1973) studied that Asaanas are physical exercises enabling the body to keep physically fit. These exercises in physical education play an importance of Asanas. The most important point to realize before starting the practice of Yoga is that the Asanas are not simple exercises but sustained scientific pattern of postures.

Moorthy and Videmen (1995) made a study on influence of exercise for the treatment of low back pain. Low back pain is one of the most common ailments of modern man. It has been estimated that 90 percent of the population on some occasion during active life, will suffer low back pain for long period of life. Twenty two men between 25 and 45 years of age working in Administrative office were selected as the subject. They were suffering from non specific lumber back pain (LBP). All the subjects were administered spinal disorder questionnaire, mood variables and selected spinal mobility variable before and after the experiment. The yogic training programme was
kept only in the evening on every day. After the experimental period, low back pain was reduced.

Giri and Giri (1995) specially evaluated the Ayurvedic literature of the Yoga technique which is applicable in the cause of mental disorder. In yogic test too, Certain practices have not only been claimed to cure a number of ailments but also to postpone decay and degeneration and even to overcome death by elongating the duration of life. Thus, it has been concluded in the end that Yoga in its totality and in wide sense in medicine is a useful therapeutic tool because it prescribed a number of phenomena and substances to table diseases in order to realize its long goes.

Yang, K. (2007) says Yoga, a form of physical activity, is rapidly gaining in popularity and has many health benefits. Yet healthcare providers have been slow to recognize Yoga for its ability to improve health conditions and few interventions have been developed that take full advantage of its benefits. The purpose of this article is to review published studies using Yoga programs and to determine the effect of Yoga interventions on common risk factors of chronic diseases (overweight, hypertension, high glucose level and high cholesterol). A systematic search yielded 32 articles published between 1980 and April 2007. The studies found that Yoga interventions are generally effective in reducing body weight, blood pressure, glucose level and high cholesterol but only a few studies examined long-term adherence. Additionally, not enough studies included diverse populations at high risk for diabetes and its related common health problems.
Innes KE, (2007) says that there is growing evidence that Yoga may offer a safe and cost-effective intervention for Type 2 Diabetes mellitus (DM 2). However, systematic reviews are lacking. This article critically reviews the published literature regarding the effects of Yoga-based programs on physiologic and anthropometric risk profiles and related clinical outcomes in adults with DM 2. They performed a comprehensive literature search using four computerized English and Indian scientific databases. The search was restricted to original studies (1970-2006) that evaluated the metabolic and clinical effects of Yoga in adults with DM 2. Studies targeting clinical populations with cardiovascular disorders that included adults with comorbid DM were also evaluated. Data were extracted regarding study design, setting, target population, intervention, comparison group or condition, outcome assessment, data analysis and presentation, follow-up and key results and the quality of each study was evaluated according to specific predetermined criteria. They identified 25 eligible studies, including 15 uncontrolled trials, 6 non-randomized controlled trials and 4 randomized controlled trials (RCTs). Overall, these studies suggest beneficial changes in several risk indices, including glucose tolerance and insulin sensitivity, lipid profiles, anthropometric characteristics, blood pressure, oxidative stress, coagulation profiles, sympathetic activation and pulmonary function, as well as improvement in specific clinical outcomes.

Sahay BK. (2007) says 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. They 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.

Malhotra V (2005) says Twenty NIDDM subjects (mild to moderate diabetics) in the age group of 30-60 years were selected from the out patient clinic of G.T.B. Hospital. They were on a 40 days Yoga asana regime under the supervision of a Yoga expert. 13 specific Yoga asanas ≤ done by Type 2 Diabetes Patients included. Surya Namaskar, Trikonasana, Tadasana, Sukhasana, Padmasana, Bhastrika Pranayama, Pashimottanasana, Ardhmatsyendrasana, Pawanmuktasana, Bhujangasana, Vajrasana, Dhanurasana and Shavasana are beneficial for diabetes mellitus. Serum insulin, plasma fasting and one hour postprandial blood glucose levels and anthropometric parameters were measured before and after Yoga asanas. The results indicate that there was significant decrease in fasting glucose levels from basal 208.3 +/- 20.0 to 171.7 +/- 19.5 mg/dl and one hour postprandial blood glucose levels decreased from 295.3 +/- 22.0 to 269.7 +/- 19.9 mg/dl. The exact mechanism as to how these postures and controlled breathing interact with somatoendocrine mechanism affecting insulin kinetics was worked out. A significant decrease in waist-hip ratio and changes in insulin levels were also observed, suggesting a positive effect of Yoga asanas on glucose utilisation and fat redistribution in NIDDM. Yoga asanas may be
used as an adjunct with diet and drugs in the management of Type 2 diabetes.

Moolasarn S (2005) says the purposes of the present survey research in diabetic patients were 1) to determine characteristics of complementary / alternative medicine (CAM) use, 2) to identify factors related to CAM use such as sociodemographic, adverse effects and quality of life and 3) to determine differences between patients who used and did not use CAM. The data was collected through developed questionnaires and SF-36 scale Thai version. Samples were 159 diabetes patients over 18 years of age or older who came for treatment at Suppasitthiprasong Hospital, Ubon Ratchathani Province, Thailand. The results indicated that the prevalence of CAM use was rather high (47.8%). The most common types of CAM used were Yoga/exercise (32.8%), unchanged form of herbal medicine (29.9%), and changed form herbal medicine (17.8%). However, the study results had some limitations to apply to other Thai populations since the sample were Suppasitthiprasong patients who may be different from other Thai populations in many ways such as their local culture, belief, and CAM use types and cost.

Manjunatha S (2005) conducted a study to examine the hypothesis that Yogasanas help in the treatment of diabetes mellitus by releasing insulin from the pancreas. Twenty healthy young volunteers (17 male, 3 female; age 19-31 years) participated in the study. Each volunteer performed four sets of asanas in random order for 5 consecutive days each with a 2-day gap between consecutive sets of asanas. The four sets of asanas were: (i) dhanurasana + matsyendrasana, (ii) halasana + vajrasana, (iii) naukasana +
bhujangasana, and (iv) setubandhasana + pavanamuktasana. Blood samples were collected on days 4 and 5 of each set of asanas for measurement of glucose and insulin levels before the asanas, within 10 min after performing the asanas, and 30 min after ingestion of 75 g glucose, which in turn was ingested immediately after the second blood sample. A standard 75 g oral glucose tolerance test (OGTT) was also done before and after the study. On the days of the pre-study or post-study OGTT, no asanas were done. The serum insulin levels after the asanas were lower (P<0.05) than those before the asanas. However, the serum insulin level 0.5 h after the post-asana oral 75 g-glucose challenge was higher (P<0.05) in Set IV than the 0.5 h postprandial insulin level in the pre-study OGTT; the same trend was observed in other sets as well although statistically not significant. The observations suggest that the performance of asanas led to increased sensitivity of the B cells of pancreas to the glucose signal. The increased sensitivity seems to be a sustained change resulting from a progressive long-term effect of asanas. The study is significant in that it has for the first time attempted to probe the mechanism by which Yogasanas help diabetes mellitus.

Garrow D (2006) says to assess the association between complementary and alternative medicine (CAM) use, preventive care practices, and use of conventional medical services among adults with diabetes.

They analyzed data on 2,474 adults with diabetes. They created an overall CAM-use category based on use of any of the following: diets, herbs,
chiropractic care, Yoga, relaxation, acupuncture, ayurveda, biofeedback, chelation, energy healing, Reiki therapy, hypnosis, massage, naturopathy, and homeopathy. They used multiple logistic regression to assess the effect of CAM use on preventive care practices (receipt of influenza and pneumonia vaccines) and use of conventional medical services (number of primary care and emergency department visits). STATA was used for statistical analysis to account for the complex survey design.

A total of 48% of adults with diabetes used some form of CAM. CAM use was independently associated with receipt of pneumonia vaccination (odds ratio 1.56 [95% CI 1.26-1.94]) but not significantly associated with receipt of influenza vaccination (1.17 [0.92-1.48]). CAM use was independently associated with visiting the emergency department (1.34 [1.06-1.70]), having six or more primary care visits (1.44 [1.14-1.83]), and having eight or more primary care visits (1.66 [1.22-2.25]).

In contrast to the findings of previous studies, CAM use appears to be associated with increased likelihood of receipt of preventive care services and increased emergency department and primary care visits. CAM use may not be a barrier to use of conventional medical services in adults with diabetes.

Bijlani RL (2005) says the objective of the study was to study the short-term impact of a brief lifestyle intervention based on Yoga on some of the biochemical indicators of risk for cardiovascular disease and diabetes mellitus.
The variables of interest were measured at the beginning (day 1) and end (day 10) of the intervention using a pre-post design.

The study is the result of operational research carried out in our Integral Health Clinic (IHC). The IHC is an outpatient facility which conducts 8-day lifestyle modification programs based on Yoga for prevention and management of chronic disease. A new course begins every alternate week of the year.

The study is based on data collected on 98 subjects (67 male, 31 female), ages 20-74 years, who attended one of our programs. The subjects were a heterogeneous group of patients with hypertension, coronary artery disease, diabetes mellitus, and a variety of other illnesses.

The intervention consisted of asanas (postures), pranayama (breathing exercises), relaxation techniques, group support, individualized advice, lectures and films on the philosophy of Yoga and the place of Yoga in daily life, meditation, stress management, nutrition, and knowledge about the illness.

The outcome measures were fasting plasma glucose and serum lipoprotein profile. These variables were determined in fasting blood samples, taken on the first and last day of the course.

Fasting plasma glucose, serum total cholesterol, low-density lipoprotein (LDL) cholesterol, very-LDL cholesterol, the ratio of total cholesterol to high density lipoprotein (HDL) cholesterol, and total triglycerides were significantly lower, and HDL cholesterol significantly higher, on the last
day of the course compared to the first day of the course. The changes were more marked in subjects with hyperglycemia or hypercholesterolemia.

The observations suggest that a short lifestyle modification and stress management education program leads to favorable metabolic effects within a period of 9 days.

Khalsa SB (2004) says Although Yoga is historically a spiritual discipline, it has also been used clinically as a therapeutic intervention. A bibliometric analysis on the biomedical journal literature involving research on the clinical application of Yoga has revealed an increase in publication frequency over the past 3 decades with a substantial and growing use of randomized controlled trials. Types of medical conditions have included psychopathological (e.g. depression, anxiety), cardiovascular (e.g. hypertension, heart disease), respiratory (e.g. asthma), diabetes and a variety of others. A majority of this research has been conducted by Indian investigators and published in Indian journals, particularly Yoga specialty journals, although recent trends indicate increasing contributions from investigators in the U.S. and England. Yoga therapy is a relatively novel and emerging clinical discipline within the broad category of mind-body medicine whose growth is consistent with the burgeoning popularity of Yoga in the West and the increasing worldwide use of alternative medicine.
Singh S. (2004) studied the effect of forty days of Yogic exercises on cardiac functions in Type 2 Diabetics. To study the effect of forty days of Yogic exercises on blood glucose level, glycosylated hemoglobin.

The present study done in twenty-four Type 2 DM cases provides metabolic and clinical evidence of improvement in glycaemic control and autonomic functions. These middle-aged subjects were type II diabetics on antihyperglycaemic and dietary regimen. Their baseline fasting and postprandial blood glucose and glycosylated Hb were monitored along with autonomic function studies. The expert gave these patients training in Yoga asanas and they pursued those 30-40 min / day for 40 days under guidance. These asanas consisted of 13 well known postures, done in a sequence. After 40 days of Yoga asanas regimen, the parameters were repeated.

The results indicate that there was significant decrease in fasting blood glucose levels from basal 190.08 +/- 18.54 in mg/dl to 141.5 +/- 16.3 in mg/dl after Yoga regimen. The post prandial blood glucose levels decreased from 276.54 +/- 20.62 in mg/dl to 201.75 +/- 21.24 in mg/dl, glycosylated hemoglobin showed a decrease from 9.03 +/- 0.29% to 7.83 +/- 0.53% after Yoga regimen. The pulse rate, systolic and diastolic blood pressure decreased significantly (from 86.45 +/- 2.0 to 77.65 +/- 2.5 pulse/min, from 142.0 +/- 3.9 to 126.0 +/- 3.2 mm of Hg and from 86.7 +/- 2.5 mm of Hg to 75.5 +/- 2.1 mm of Hg after Yoga regimen respectively). Corrected QT interval (QTc) decreased from 0.42 +/- 0.0 to 0.40 +/- 0.0.

These findings suggest that better glycaemic control and stable autonomic functions can be obtained in Type 2 DM cases with Yoga asanas.
and pranayama. The exact mechanism as to how these postures and controlled breathing interact with somato-neuro-endocrine mechanism affecting metabolic and autonomic functions remains to be worked out.

Malhotra V (2002) says twenty Type 2 diabetic subjects between the age group of 30-60 years were studied to see the effect of 40 days of Yoga asanas on the nerve conduction velocity. The duration of diabetes ranged from 0-10 years. Subject suffering from cardiac, renal and proliferative retinal complications were excluded from the study. Yoga asanas included Suryanamskar, Tadasan, Konasan, Padmasan Pranayam, Paschimottansan Ardhmatsyendrasan, Shavasan, Pavanmukthasan, Sarpasan and Shavasan. Subjects were called to the cardio-respiratory laboratory in the morning time and were given training by the Yoga expert. The Yoga exercises were performed for 30-40 minutes every day for 40 days in the above sequence. The subjects were prescribed certain medicines and diet. The basal blood glucose, nerve conduction velocity of the median nerve was measured and repeated after 40 days of Yogic regime. Another group of 20 Type 2 diabetes subjects of comparable age and severity, called the control group, were kept on prescribed medication and light physical exercises like Walking. Their basal & post 40 days parameters were recorded for comparison. Right hand and left hand median nerve conduction velocity increased from 52.81 +/- 1.1 m/sec to 53.87 +/- 1.1 m/sec and 52.46 +/- 1.0 to 54.75 +/- 1/1 m/sec respectively. Control group nerve function parameters deteriorated over the period of study, indicating that diabetes is a slowly progressive disease involving the nerves. Yoga asanas have a beneficial effect on glycaemic
control and improve nerve function in mild to moderate Type 2 diabetes with sub-clinical neuropathy.

Sahay BK (2002) says India has the largest diabetic population in the world. Change in eating habits, increasing weight and decreased physical activity are major factors leading to increased incidence of type 2 diabetes. Obesity is the most important modifiable risk factor. Smoking is an independent risk factor for type 2 diabetes mellitus. Diet and exercise are primary therapeutic options for its management. Dietary management should not only aim to achieve glycaemic control but to normalise dyslipidaemia. Smoking cessation reduces the risk of morbidity and mortality in CAD. Exercise improves the condition of a diabetic patient. Exercise includes Yoga practices which have a role to play in the prevention of type 2 diabetes.

Galantino ML (2008) completed a systematic review of the literature on the effect of Yoga on quality of life and physical outcome measures in the pediatric population. We explored various databases and included case-control and pilot studies, cohort and randomized controlled trials that examined Yoga as an exercise intervention for children.

Using the Sackett levels of evidence, this article reviews the literature on Yoga as a complementary mind-body movement therapy. We address the research through three practice patterns according to the Guide to Physical Therapist Practice and provide considerations for the inclusion of Yoga into clinical practice.
The evidence shows physiological benefits of Yoga for the pediatric population that may benefit children through the rehabilitation process, but larger clinical trials, including specific measures of quality of life are necessary to provide definitive evidence.

Innes KE, (2007) says Cardiovascular disease (CVD) is the leading cause of death and disability in the industrialized world, and its prevalence is rapidly increasing among developing nations. The increasing global prevalence of CVD reflects in part the concurrent rise in insulin resistance, obesity, dyslipidemia, and other atherogenic changes associated with insulin resistance syndrome (IRS). Evidence suggests that chronic stress and related psychosocial factors also play an important role in the development and progression of IRS-related states and ultimately, in the pathogenesis of CVD. Designed to address these interrelated psychological and physiological components of health, Yoga and other traditional mind-body therapies may offer particular promise in both the primary and secondary prevention of CVD. In this article, we review the evidence regarding the potential benefits of specific mind-body modalities for CVD risk reduction and discuss possible mechanisms underlying these observed effects.

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not only aim to achieve glycaemic control but to normalise dyslipidaemia. Smoking cessation reduces the risk of morbidity and mortality in CAD. Exercise improves the condition of a diabetic patient. Exercise includes Yoga practices which have a role to play in the prevention of type 2 diabetes.

2.2 STUDY ON WALKING

Malhotra, V. (1999), to studied the effect of forty days of Yogic exercises on cardiac functions in Type 2. Diabetics. 2. To study the effect of forty days of Yogic exercises on blood glucose level, glycosylated, hemoglobin. The present study done in twenty-four Type 2 DM cases provides metabolic and clinical evidence of improvement in glycaemic control and autonomic functions. These middle-aged subjects were type II diabetics on antihyperglycaemic and dietary regimen. Their baseline fasting and postprandial blood glucose and glycosylated Hb were monitored along with autonomic function studies. The expert gave these patients training in Yoga asanas and they pursued those 30-40 min / day for 40 days under guidance. These asanas consisted of 13 well known postures, done in a sequence. After 40 days of Yoga asanas regimen, the parameters were repeated. The results indicate that there was significant decrease in fasting blood glucose levels from basal 190.08 ± 18.54 in mg / dl to 141.5 ± 16.3 in mg / dl after Yoga regimen. The post prandial blood glucose levels decreased from 276.54 ± 20.62 in mg / dl to 201.75 ± 21.24 in mg / dl, glycosylated hemoglobin showed a decrease from 9.03 ± 0.29 % to 7.83 ± 0.53 % after Yoga regimen. The pulse rate, systolic and diastolic blood pressure decreased significantly (from 86.45 ± 2.0 to 77.65 ± 2.5 pulse / min, from 142.0 ± 3.9 to 126.0 ± 3.2 mm of
Hg and from 86.7 ± 2.5 mm of Hg to 75.5 ± 2.1 mm of Hg after Yoga regimen respectively). Corrected QT interval (QTc) decreased from 0.42 ± 0.0 to 0.40 ± 0.0. These findings suggest that better glycaemic control and stable autonomic functions can be obtained in Type 2 DM cases with Yoga asanas and pranayama. The exact mechanism as to how these postures and controlled breathing interact with somato-neuro-endocrine mechanism affecting metabolic and autonomic functions remains to be worked out.

Frier BM. (2008) says Hypoglycaemia is the commonest side-effect of insulin treatment for diabetes, and is the single greatest barrier to achieving and maintaining good glycaemic control. Severe hypoglycaemia (requiring assistance for recovery) is associated with significant morbidity and is feared by most people with type 1 diabetes and their families. It causes stress and anxiety and may influence self-management and glycaemic control. The annual prevalence of severe hypoglycaemia is around 30% in people with type 1 diabetes and is higher in those with risk factors such as strict glycaemic control, impaired awareness of hypoglycaemia and increasing duration of diabetes. It is also common during sleep (nocturnal hypoglycaemia). Neurological manifestations include coma, convulsions, transient hemiparesis and stroke, while reduced consciousness and cognitive dysfunction may cause accidents and injuries. Cardiac events may be precipitated such as arrhythmias, myocardial ischaemia and cardiac failure. Hypoglycaemia can affect all aspects of life, including employment, driving, recreational activities involving exercise, and travel, and measures should be
taken in all of these situations to avoid this potentially dangerous side-effect of insulin therapy.

Frier BM (2007) says up to 60% of the patients with diabetes mellitus suffer from gastrointestinal tract symptoms that arise pathogenetically from a disturbance of the autonomous nervous system. Patient age, disease duration and poor control of diabetes mellitus correlate positively with the presence of gastrointestinal symptoms. Chronic constipation, in addition to diarrhoea, gall bladder dysfunction and incontinence, is increasingly regarded as a serious problem and for the first time, is now considered in the current guidelines of the professional societies. Modern diagnosis and treatment facilitate systematic control of the symptoms. Treatment necessitates long-term intake of laxatives, proper diabetes control and other accompanying general measures such as adequate amounts of liquids, dietary fibre and exercise. Motility and secretion-stimulating, osmotically active or locally applied laxatives are used. Slow transit constipation, which is typically observed in diabetics, can be best controlled with polyethylene glycol, bisacodyl or sodium picosulphate.

Milani RV (2007) says Peripheral arterial disease (PAD) is currently a major health problem affecting 8-12 million Americans, 15-40% of whom will have intermittent claudication that can lead to substantial impairment in their ability to carry out normal daily activities as well as perform the recommended cardiovascular exercise. Supervised exercise training is an effective tool in the treatment of claudication and is currently a recommended first-line therapy for patients with this condition. In addition to improving pain-free Walking
distance and quality of life, supervised exercise training can improve many cardiovascular risk factors, possibly reducing the risk for subsequent myocardial infarction, stroke, and death. This paper will review the benefits of supervised exercise training in patients with PAD.

Candib LM. (2007) says Around the world obesity and diabetes are climbing to epidemic proportion, even in countries previously characterized by scarcity. Likewise, people from low-income and minority communities, as well as immigrants from the developing world, increasingly visit physicians in North America with obesity, metabolic syndrome, or diabetes. Explanations limited to lifestyle factors such as diet and exercise are inadequate to explain the universality of what can be called a syndemic, a complex and widespread phenomenon in population health produced by multiple reinforcing conditions. Underlying the problem are complex factors-genetic, physiological, psychological, familial, social, economic, and political-coalescing to overdetermine these conditions. These interacting factors include events occurring during fetal life, maternal physiology and life context, the thrifty genotype, the nutritional transition, health impact of urbanization and immigration, social attributions and cultural perceptions of increased weight, and changes in food costs and availability resulting from globalization. Better appreciation of the complexity of causation underlying the worldwide epidemic of obesity and diabetes can refocus the work of clinicians and researchers to work at multiple levels to address prevention and treatment for these conditions among vulnerable populations.
Mottola MF (2007) says Gestational diabetes mellitus (GDM) is a form of diabetes first diagnosed during pregnancy, usually between 24 and 28 weeks. Currently, management for women with GDM consists of medical nutrition therapy with adjunctive exercise for at least 30 minutes / day. Patients who fail to maintain glycemic goals through diet and exercise therapy are given insulin injections. Several epidemiological studies have suggested a robust link between physical activity and reduced risk of GDM; however, researchers have been unable to suggest a cost-effective, easily accessible, evidence-based program with guidelines for frequency, intensity, duration, and type of activity to prevent the incidence of GDM in sedentary, at-risk populations. True effectiveness of specific structured exercise programs remains untapped in GDM prevention and treatment and many well-controlled exercise studies are warranted.

Wells IC (2008) says the evidence is reviewed supporting the presence of an inherited structural defect in the plasma membranes of somatic cells of humans who have type 2 diabetes mellitus and sodium-sensitive essential hypertension. This magnesium-binding defect (MgBD) consists of a decreased content of tightly bound Mg2+ ion in the cell membrane and limits the amount of Mg2+ that enters the cell, some of which combines with ATP4-, produced by the cell, to form MgATP2-, the currency of metabolic energy. Consequently, in both prediabetes and overt diabetes, the intracellular concentration of the interdependent Mg2+ and MgATP2- ions is significantly less than normal. These 2 ions are required as cofactors and (or) substrates for some 300 enzyme systems in human metabolism, many of which are
involved with insulin. Thus the decreased activities of particular ones of these enzyme systems due to the decreased intracellular [Mg2+] and its dependent [MgATP2-] are responsible for (i) insulin resistance and (ii) decreased insulin secretion and (or) production, the 2 pathophysiological processes required for the occurrence of type 2 diabetes mellitus. These 2 processes can account for all of the morbid symptoms associated with this disease. Thus, the decreased intracellular concentration of the interdependent Mg2+ and MgATP2- ions constitutes the etiology of genetic predisposition to type 2 diabetes mellitus and can be corrected by 2 identified peptide Mg2+-binding promoters that are derived from the carboxyl terminal of the tachykinin substance P and occur in normal blood plasma. Decreased intracellular [Mg2+] and [MgATP2-] can also result from a dietary deficiency of magnesium or from an abnormal accumulation of saturated fatty acids in cell membranes which inhibits the entrance of Mg2+ into the cell; thus it is also the etiology not only of diabetes caused by magnesium deficiency but also of the "lipotoxic" type 2 diabetes mellitus. Although these pathologies cannot be corrected by the Mg2+-binding promoters, they can be corrected, respectively, by dietary magnesium supplementation or by exercise plus dietary caloric and lipid restriction. Theoretically, the disease syndrome containing type 2 diabetes mellitus may involve approximately 30% of the population.

Colberg SR. (2007) says Control of blood glucose levels in individuals with diabetes mellitus (DM) is directly affected by the balance between insulin and glucose-raising endocrine hormones, along with other metabolic factors, including fuel use and availability, exercise intensity and duration, training
status, and visceral fat levels, all of which can impact the effect of physical activity on insulin action in diabetic or prediabetic individuals. Current research suggests that type 2 DM can be prevented and controlled with increased physical activity, largely through improvements in the muscles' sensitivity to insulin that are affected by changes in both glucose and fat metabolism. In addition, abnormal insulin action in the body is associated with a host of other health conditions, including cardiovascular disease and hypertension, which can be better controlled when their associations are fully understood. This article discusses the importance of varying types of physical activity on insulin action to enhance metabolic control and how they can be undertaken safely by all diabetic individuals.

Moran LJ (2008) says Polycystic ovary syndrome (PCOS) is a common condition in women with reproductive age associated with reproductive and metabolic dysfunction. Treatment has traditionally focused on fertility and hormonal therapy. However, obesity, central obesity, and insulin resistance (IR) are strongly implicated in its etiology, and improving these factors has become a treatment target in PCOS. Lifestyle modification programs with an emphasis on behavioral management and dietary and exercise interventions have been successful in reducing the risk of diabetes and the metabolic syndrome in the general population and improving reproductive and metabolic features in PCOS, although as yet there is limited evidence for specific dietary and exercise approaches and guidelines for use in PCOS and requires further investigation. The use of antiobesity pharmacologic agents and bariatric surgery has been recently studied in PCOS and may offer additional
treatment options for the future. Future research should focus on the optimal
dietary strategies and exercise regimens for PCOS treatment and the relative
efficacy and appropriate use of lifestyle management versus antiobesity
pharmacologic agents and surgery.

Kruk J (2007) says physical activity is widely recognized as a means
for the primary prevention of chronic diseases as well as in patients' treatment
and rehabilitation. Moreover, activity has beneficial effects on an individual's
health and well-being. Despite the benefits of regular physical activity, the
percentage of physically inactive adults in the world is high. Environmental
and policy approaches aimed to increase physical activity require continual
stress of the epidemiological evidence from studies investigating disease
mechanisms as well as controlled clinical trials. The main purpose of the
study is to update the evidence that physical activity / exercise is important for
reducing the chronic diseases (cardiovascular and heart, diabetes, cancer,
obesity, osteoporosis, and fall-related injuries, depression and emotional
stress) and for mechanisms that may operate in the relation between physical
activity and a disease risk.

Recent evidence on physical activity / exercise and reduction of chronic
major diseases incidence and rehabilitation of patients replicates previous
findings. The strongest evidence exists for colon cancer, breast cancer, and
cardiovascular diseases. The maximal magnitudes of the risk reduction
reported were: 75% for breast cancer, 49% for cardiovascular and heart
diseases, 35% for diabetes, 22% for colorectal cancer. Increased physical
activity also prevented the weight gain associated with aging at least
2-times greater in individuals who were more active compared with those who were inactive. Limited new findings has been reported for the beneficial role of physical activity in fall-related injuries, depression and emotional distress.

Martin S (2008) says Diabetes mellitus type 2 is a life-style disease that is triggered by obesity and lack of physical activity. The pathophysiological basis of the disease is a reduction of insulin sensitivity, that is caused by the trigger factors. Glucose metabolic disorders appear if overproduction of insulin can not compensate the insulin resistance. In early phases postprandial blood glucose is increased, in late phases elevation of fasting blood glucose is noted. In the general awareness manifestation of type 2 diabetes is associated with an initiation of a pharmacological therapy. This is not the case, as described in detail in this review. Next to epidemiological studies which indicate trigger factors, intervention trials will be discussed that led to a shift in paradigm in the diabetology. Non-pharmacological interventions are a therapeutical alternative in a lot of patients or are able to reduce the amount of antidiabetic agents significantly.

Farmer JA (2008) says Diabetes is a highly prevalent disease in the United States and is increasing in both incidence and prevalence. Atherosclerotic vascular disease is a major cause of morbidity and mortality in diabetic patients. Type 2 diabetes is characterized by insulin resistance and frequently co-exists with a variety of cardiovascular risk factors, including hypertension, obesity, dyslipidemia, and physical inactivity. Hygienic measures such as weight loss and exercise should form the basis of therapeutic interventions in the prevention and treatment of type 2 diabetes.
The role of dyslipidemia as a causal factor in vascular disease associated with diabetes was previously downplayed because total cholesterol was frequently normal or minimally elevated. However, diabetic dyslipidemia is characterized by elevated triglycerides, low high-density lipoprotein, and small, dense low-density lipoprotein, the combination of which has been termed the "lipid triad."

The role of lipid modification as a means to decrease cardiovascular risk in type 2 diabetes has recently been clarified by a number of clinical trials. Subgroup analysis in early studies implied the potential for benefit of lipid modification in diabetes. The results of these early studies prompted the design of large-scale intervention trials that employed statin and fibric acid derivatives in diabetes patients. The preponderance of data from the statin trials implicates significant clinical benefit in cardiovascular risk reduction. The fibric acid derivatives have theoretic advantages in diabetic dyslipidemia. However, the robust bulk of clinical data obtained from prospective statin studies is lacking for the fibric acid derivatives, and the results of the major trials are equivocal.

Settiwar (1975) Pranayama is a basic yogic breathing technique, of which one of the methods is nadisodhana wherein breathing is performed through alternate nostrils. The present study aims at identifying the energy cost of nadisodhana and compare it with standard physical activities such as controlled treadmill-Walking and field-Walking. The present study was conducted on twelve normal healthy male volunteers who have been practicing Yoga and pranayama over a period of three years. The energy cost of nadisodhana and field-Walking was derived from individual regression
equations using oxygen consumption and heart rates recorded during a maximal graded exercise test on treadmill carried out in a thermoneutral environment. The predicted oxygen consumption and heart rate during nadisodhana were significantly lower than in field-Walking ($p<0.05$ & $0.01$) and treadmill-Walking ($p<0.01$ & $0.01$) indicating that the energy cost for nadisodhana is lower. Oxygen pulse during nadisodhana was also significantly lower than field-Walking ($p<0.05$) and treadmill-Walking ($p<0.05$). It was also observed that during nadisodhana blood lactate was significantly lower ($p<0.01$ & $0.05$) than during the other two tests studied and pyruvate was significantly higher ($p<0.01$) than during treadmill-Walking. The results indicate low exertion on the subjects, based on Borg scale during nadisodhana than in other forms of physical exercises. This low exertion may be attributed to efficient metabolic adaptations during nadisodhana. In view of the above findings nadisodhana can be included in the battery of fitness programs for both healthy and diseased individuals.

2.3 STUDIES ON PHYSIOLOGICAL VARIABLES

Murugesan (1990) conducted a study on effect of hollow sprints and fartlek training on selected physiological variables. For the purpose of the study ninety male subjects from Muthuiah Alagppa Matriculation higher Secondary School, Kottaiyur, Sivagangai District were selected at random. Their age ranging from fourteen to sixteen years. The investigator selected physiological variables such as haemoglobin content, mean arterial blood pressure, pulse rate and breath holding time. To compare the variables ANACOVA (Analysis of covariance) technique was employed. It was found
out that farley training group when compared in hollow sprints group, fartlek training group had a significant improvement in hemoglobin content and hollow sprints group had a significant improvement in breath holding time, pulse rate and mean arterial blood pressure.

Stuvalt and Collings (1979) compared the vital capacity of twenty athletes with those of twenty non-athletes and found that the mean vital capacity of the athletes was significantly higher than non-athletes. The author concluded that this significant difference in vital capacity was due to regular training. A group of sixty eight adolescent boys who took regular exercise gained 130cc in vital capacity in four months while a group of fifty boys who did not do exercise had a gain of only 20cc. College students who took part in physical activities during their college course gained 625cc while their sedentary colleagues gained only 295cc. Occasionally, however, even special exercise fails to influence vital capacity. In a group of twenty-two fresh girls in a college, eleven showed no improvement while others improved by 210 to 600cc.

Schrauwen-Hinderling VB (2007) says Muscular mitochondrial dysfunction, leading to the accumulation of fat in skeletal muscle, has been proposed to be involved in the development of type 2 diabetes mellitus. Here, we review human studies that investigated various aspects of mitochondrial function in relation to muscular insulin sensitivity and/or diabetes.

In-vivo magnetic resonance spectroscopy allows assessment of mitochondrial functionality from adenosine triphosphate flux in the nonexercising state and from phosphocreatine recovery from (sub)maximal
exercising. Application of both approaches revealed reduced mitochondrial oxidative capacity in insulin-resistant (pre)diabetic humans. Reductions in mitochondrial density may contribute to, or even underlie, these findings as well as intrinsic defects in mitochondrial respiration. So far, only two studies reported measurements of mitochondrial respiratory capacity in intact mitochondria in diabetic patients, with inconsistent findings.

Muscular mitochondrial aberrations in type 2 diabetes mellitus can be detected, but it is so far unclear if these aberrations are causally related to the development of the disease. Alternatively, mitochondrial dysfunction may simply be the consequence of elevated plasma fatty acids or glucose levels.

Gupta N (2006) says considerable evidence exists for the place of mind body medicine in the treatment of anxiety disorders. Excessive anxiety is maladaptive. It is often considered to be the major component of unhealthy lifestyle that contributes significantly to the pathogenesis of not only psychiatric but also many other systemic disorders. Among the approaches to reduce the level of anxiety has been the search for healthy lifestyles. The aim of the study was to study the short-term impact of a comprehensive but brief lifestyle intervention, based on Yoga, on anxiety levels in normal and diseased subjects. The study was the result of operational research carried out in the Integral Health Clinic (IHC) at the Department of Physiology of All India Institute of Medical Sciences. The subjects had history of hypertension, coronary artery disease, diabetes mellitus, obesity, psychiatric disorders (depression, anxiety, 'stress'), gastrointestinal problems (non ulcer dyspepsia, duodenal ulcers, irritable bowel disease, Crohn's disease, chronic
constipation) and thyroid disorders (hyperthyroidism and hypothyroidism). The intervention consisted of asanas, pranayama, relaxation techniques, group support, individualized advice, and lectures and films on philosophy of Yoga, the place of Yoga in daily life, meditation, stress management, nutrition, and knowledge about the illness. The outcome measures were anxiety scores, taken on the first and last day of the course. Anxiety scores, both state and trait anxiety were significantly reduced. Among the diseased subjects significant improvement was seen in the anxiety levels of patients of hypertension, coronary artery disease, obesity, cervical spondylitis and those with psychiatric disorders. The observations suggest that a short educational programme for lifestyle modification and stress management leads to remarkable reduction in the anxiety scores within a period of 10 days.

Bijlani RL (2005) studied the short-term impact of a brief lifestyle intervention based on Yoga on some of the biochemical indicators of risk for cardiovascular disease and diabetes mellitus. DESIGN: The variables of interest were measured at the beginning (day 1) and end (day 10) of the intervention using a pre-post design. The study is the result of operational research carried out in our Integral Health Clinic (IHC). The IHC is an outpatient facility which conducts 8-day lifestyle modification programs based on Yoga for prevention and management of chronic disease. A new course begins every alternate week of the year. The study is based on data collected on 98 subjects (67 male, 31 female), ages 20-74 years, who attended one of the programs. The subjects were a heterogeneous group of patients with hypertension, coronary artery disease, diabetes mellitus, and a variety of
other illnesses. The intervention consisted of asanas (postures), pranayama (breathing exercises), relaxation techniques, group support, individualized advice, lectures and films on the philosophy of Yoga and the place of Yoga in daily life, meditation, stress management, nutrition, and knowledge about the illness. The outcome measures were fasting plasma glucose and serum lipoprotein profile. These variables were determined in fasting blood samples, taken on the first and last day of the course. Fasting plasma glucose, serum total cholesterol, low-density lipoprotein (LDL) cholesterol, very-LDL cholesterol, the ratio of total cholesterol to high density lipoprotein (HDL) cholesterol, and total triglycerides were significantly lower, and HDL cholesterol significantly higher, on the last day of the course compared to the first day of the course. The changes were more marked in subjects with hyperglycemia or hypercholesterolemia. The observations suggest that a short lifestyle modification and stress management education program leads to favorable metabolic effects within a period of 9 days.

Yadav RK (2008) says Oxidative stress contributes to the process of aging as well as a variety of chronic degenerative diseases. There are indications that psychological stress increases oxidative stress whereas relaxation decreases it. They measured the concentration of thiobarbituric acid reactive substances (TBARS) in blood as an indicator of oxidative stress at the beginning and at the end of a comprehensive Yoga-based lifestyle modification program (YLMP). The data was collected from 104 subjects (59 male, 45 female), 19-71 years of age (mean +/- SD, 41.2 +/- 14.6 years). The YLMP consisted of a nine-day educational out-patient course on the theory
and practice of Yoga and included, besides a daily one-hour practice of physical postures (asanas) and breathing exercises (pranayama), lecture and films on Yoga, stress management and nutrition, practice of meditation and shavasana (a relaxation technique), and individual counseling. Venous blood samples were collected on the first and last day of the course. The serum concentration of TBARS decreased significantly from 1.72 +/- 0.72 nmoles/ml on day 1 to 1.57 +/- 0.72 nmoles/ml on day 10 (P<0.05). The study suggests that a brief low cost lifestyle intervention based on Yoga reduces oxidative stress.

Michalsen A (2005) says stress reduction and comprehensive lifestyle modification programs have improved atherosclerosis and cardiac risk factors in earlier trials. Little is known about the impact of such programs on quality-of-life (QoL) and psychological outcomes. Given recent significant improvements in cardiac care, they evaluated the current benefit of stress reduction/lifestyle modification on QoL and emotional distress in patients with coronary artery disease (CAD).

101 patients (59.4 +/- 8.6 years, 23 female) with CAD were randomized to a 1-year lifestyle/stress management program (n = 48) or written advice (n = 53). QoL and psychological outcomes were assessed with the SF-36, Beck Depression, Spielberger State/Trait Anxiety, Spielberger State/Trait Anger and Perceived Stress Inventories. Group repeated-measures, analysis of variance were performed for all measures.

Adherence to the program was excellent (daily relaxation practice 39 +/- 5 vs. 5 +/- 8 min, respectively; p < 0.001). Both groups improved
comparably in most dimensions of QoL, and significantly greater improvements for the lifestyle group were found for physical function and physical sum score ($p = 0.046$ and $p = 0.045$). Depression, anxiety, anger and perceived stress were reduced similarly in both groups. However, intervention x gender interaction effects revealed greater benefits among women in the lifestyle intervention vs. advice group for depression and anger ($p = 0.025$ and $p = 0.040$), but no effects for men.

A comprehensive lifestyle modification and stress management program did not improve psychological outcomes in medically stable CAD patients. The program did appear to confer psychological benefits for women but not men. Further trials should investigate gender-related differences in coronary patient responses to behavioral interventions.

Khalsa SB (2006) conducted a study previous research has suggested that Yoga and meditation practices are effective in stress management, alleviating anxiety and musculoskeletal problems and improving mood and cognitive and physical performance. Musicians experience a number of challenges in their profession including high levels of stress, performance anxiety and performance-related musculoskeletal conditions. Yoga and meditation techniques are therefore potentially useful practices for professional musicians.

Musicians enrolled in a prestigious 2-month summer fellowship program were invited to participate in a regular Yoga and meditation program at a Yoga center during the course of the program. The 10 participants in the Yoga program completed baseline and end-program questionnaires
evaluating performance-related musculoskeletal conditions, performance anxiety, mood and flow experience. Fellows not participating in the Yoga program were recruited to serve as controls and completed the same assessments (N=8).

The Yoga participants showed some improvements relative to control subjects on most measures, with the relative improvement in performance anxiety being the greatest.

The results from this preliminary study suggest that Yoga and meditation may be beneficial as a routine practice to reduce performance anxiety in musicians.

Yogendra J (2004) says Yoga based lifestyle modifications have been earlier shown to be beneficial in coronary artery disease in a small number of patients. We evaluated the role of lifestyle modification based on Yoga techniques, stress management and dietary modifications in retardation of coronary artery disease.

This prospective, controlled, open trial included angiographically proven coronary artery disease patients (71 patients in study group and 42 patients in control group). They were assessed clinically, by biochemical parameters, stress myocardial perfusion and function studies and coronary angiography and on psychological parameters. The study group patients were given a family based Yoga Programme which included, control of risk factors, dietary modifications and stress management for a period of one year. The
patients were assessed at baseline, at frequent intervals and at the end of one year.

At the end of one year of Yoga training, statistically significant changes (P<0.05) were found in serum total cholesterol (reduction by 23.3% in study group patients as compared to 4.4% in controls); serum LDL cholesterol (reduction of 26% in study group patients as compared to 2.6% in the control group), regression of disease (43.7% of study group patients vs 31% control group on MPI and 70.4% of study group vs 28% of control group on angiography) arrest of progression (46.5% study group vs 33.3% control group on MPI) and progression (9.9% of study group vs 35.7% of controls on MPI, 29.6% of study group vs 60.0% of controls on angiography). At the end of the study improvement in anxiety scores was concordant with the improvement seen in the MPI. No untoward effects of the therapy were observed.

Yoga based lifestyle modifications help in regression of coronary lesions and in improving myocardial perfusion. This is translated into clinical benefits and symptomatic improvement.

Kreitzer MJ (2005) conducted a study in 2001, more than 24000 solid-organ transplant surgeries were performed in the United States. Although survival rates have steadily risen over the past 2 decades, transplant recipients commonly experience a myriad of symptoms after transplantation that compromise quality of life. Anxiety, depression, and insomnia frequently occur despite excellent function of the transplanted organ. Use of
complementary and alternative medicine has risen sharply over the past 10 years, particularly among people with chronic illnesses.

Twenty solid-organ transplant recipients were enrolled in a clinical trial of mindfulness-based stress reduction. During the 8-week course, subjects learned various forms of meditation and gentle hatha Yoga. Participants were given audiotapes for home practice and maintained practice diaries. Longitudinal analysis focused on the impact of mindfulness-based stress reduction on symptom management, illness intrusion, and transplant-related stressors.

Significant improvements in the quality and duration of sleep continued for 6 months after completion of the mindfulness-based stress reduction course. Improvements after the completion of the course were also noted in self-report measures of anxiety and depression.

Mindfulness-based stress reduction is an effective treatment in improving the quality and duration of sleep. Because sleep is highly correlated with positive mental health and overall well-being, these findings suggest that mindfulness-based stress reduction has the potential of being an effective, accessible and low-cost intervention that could significantly change transplant recipients' overall health and well-being.

Schwickert M (2006) says between 60 and 90% of patients consult their family doctor for stress-associated complaints. Not infrequently, a considerable number of these patients already have elevated blood pressure. The positive effect on high blood pressure of relaxation techniques has been
confirmed in various studies. Accordingly, stress management should now have a permanent place in effective antihypertensive treatment. Appropriate relaxation techniques include, for example, autogenic training, progressive muscle relaxation, visualization and breathing exercises, chi gong and Yoga. These practices are incorporated in various lifestyle programs. They act in different ways, and can be offered to the patient in accordance with his/her individual wishes.

Upton and Sagar (1983) conducted a study to compare the physiological profiles on highly trained middle aged women distance runners with sedentary middle aged women. Thirty-eight women, who had run at least one marathon and were currently training for another, comprised the training group. Thirty-five women who had not participated in the aerobic exercise programme within the past five years comprised the control group. Body composition analysis included height, weight and body fat. Forced vital capacity, forced expiratory volume for the subjects in the standing position were measured using spirometre and blood pressure were measured by the sphygmomanometer. All the subjects were similar in weight and height but untrained subjects were significantly greater than the trained subjects in total body weight. The women runners had significantly greater maximum aerobic power. The trained women had significantly lower resting pulse rate.

Sathasivam Selvaraju (1991) conducted a study on effects of circuit training and aerobic exercise on selected physiological variables and motor abilities among schoolboys. For the purpose of the study ninety subjects were selected randomly age between eleven to sixteen years. The subjects
were divided into three equal groups each consists of 30. One was control and the two were experimental groups. The investigator selected the variables such as agility, speed, power, breath holding time, pulse rate and vital capacity. F-ratio was used for statistical technique. It was found that circuit training and aerobic exercise had significantly improved speed, power, agility, breath holding time, vital capacity and pulse rate.

Anaban, V. (1993) conducted a comparative study on selected physical, physiological and psychological variables between Nicobar and Karaikal School boys in Jawahar Navodaya Vidyalayas. For the purpose of this study 30 students from Jawahar Navodaya Vidyalaya of the Nicobar and 30 students from Jawahar Navodaya Vidyalaya, Karaikal were selected. Physical, physiological and psychological variables were selected as variables. F-ratio was employed for statistical analysis. It was found out that the physical variables of the Nicobar boys were better than the Karaikal boys and the physiological variables of the Nicobar boys were better than the Karaikal boys.

Annaiyappaudayar Rajumohan (1991) conducted a study on comparative effects of physical training programme on selected physical and physiological variables among school students. For the purpose of the study seventy – five boys in the age group of 13 to 15 years were selected from Kendriya Vidyalaya, Coimbatore. The subjects were divided into three equal groups consisting of twenty - five students each. The groups were randomly assigned as swimming cycling and control groups. The investigator selected the variables such as muscular endurance, flexibility, pulse rate and vital
capacity. ANACOVA was used for statistical technique. It was found that the practice of cycling and swimming improved efficiency significantly in physical variables compared to that of physiological variables such as muscular endurance, flexibility, pulse rate and vital capacity.

Uppal (1980) conducted a study on comparative effects of two duration load methods and Interval training method on cardio-respiratory endurance and selected physiological

2.4 STUDIES ON BIO-CHEMICAL VARIABLES

Tarigopula Veeraiah Choudary (1991) conducted a study about analysis of circuit training variations on selected biochemical variables on college men athletes. For the purpose of the study 60 male subjects from SRVBSJB Maharani autonomous college, peddapuram, Andhra Pradesh were selected, and their age ranged from 17 to 21. The subjects were divided into two experimental and one control group three equal groups of 20 each. The researcher selected blood sugar, cholesterol, pyretic acid and lactic acid as the variables for the study. To compare the statistical data ANACOVA was adopted. It was found out that there was no effect no blood sugar level because of circuit training. At the same time circuit training had significantly reduced blood cholesterol.

Devathunaj Sundararaj (1992) conducted a study on effect of aerobic and anaerobic exercises no selected biochemical variables of college men non-athletes. For the purpose of the study ninety male subjects from Madras Veterinary College, Madras was selected. The age of the subjects selected
was between seventeen and twenty years. The subjects were divided into three experimental groups namely aerobic exercise group and anaerobic exercise group. The investigator selected the variables such as blood lactic acid. Serum cholesterol, blood glucose and red blood cells count and ANACOVA technique was used for the statistical purpose. It was found that groups, which did aerobic and anaerobic exercise groups, have significantly reduced cholesterol level than the control group. It was also fond that there was no significant difference in serum cholesterol level between the aerobic and anaerobic exercise groups in red blood cells count.

Tupper T (2007) says Metabolic syndrome is characterized by abnormal glucose levels, central obesity, hypertension, elevated triglycerides, and low HDL cholesterol. This article reviews available data regarding the impact of lifestyle modification and drug therapies on the progression to diabetes in high risk individuals, such as those with hypertension, dyslipidemia, obesity, and prediabetes. Lifestyle and pharmacological interventions may alter metabolic parameters and impact progression to diabetes. However, the cost-effectiveness of these interventions are unclear.

Brietzke SA (2007) says far more work remains to be done to unravel the tangled web of pathophysiology responsible for the metabolic syndrome. This article addresses several aspects of the current controversy surrounding the metabolic syndrome: (1) definition of the metabolic syndrome; (2) evidence for and against the use of the metabolic syndrome as a cardiovascular disease risk predictor; (3) evidence as to underlying pathophysiology; and (4) evidence for treatment of the metabolic syndrome
(as opposed to components of the syndrome) in a risk reduction strategy to prevent type 2 diabetes mellitus or cardiovascular disease.

Russell-Jones D, Khan R. (2007) says insulin therapy or intensification of insulin therapy commonly results in weight gain in both type 1 and type 2 diabetes. This weight gain can be excessive, adversely affecting cardiovascular risk profile. The spectre of weight gain can increase diabetic morbidity and mortality when it acts as a psychological barrier to the initiation or intensification of insulin, or affects adherence with prescribed regimens. Insulin-associated weight gain may result from a reduction of blood glucose to levels below the renal threshold without a compensatory reduction in calorie intake, a defensive or unconscious increase in calorie intake caused by the fear or experience of hypoglycaemia, or the 'unphysiological' pharmacokinetic and metabolic profiles that follow subcutaneous administration. There is, however, scope for limiting insulin-associated weight gain. Strategies include limiting dose by increasing insulin sensitivity through diet and exercise or by using adjunctive anorectic or insulin-sparing pharmacotherapies such as pramlintide or metformin. Insulin replacement regimens that attempt to mimic physiological norms should also enable insulin to be dosed with maximum efficiency. The novel acylated analogue, insulin detemir, appears to lack the usual propensity for causing weight gain. Elucidation of the pharmacological mechanisms underlying this property might help clarify the mechanisms linking insulin with weight regulation.

Cali AM (2008) says the prevalence of obesity in youth is increasing alarmingly among children and adolescents in the United States. The problem
falls disproportionately on African-American and Hispanic children. Many of
the metabolic and cardiovascular complications associated with obesity are
already present during childhood and are closely linked to the concomitant
insulin resistance/hyperinsulinemia and degree of obesity. Moreover, these
co-morbidities persist into adulthood.

The progression from normal glucose tolerance to type 2 diabetes
mellitus involves an intermediate stage known as prediabetes or impaired
glucose regulation. Prediabetes is characterized by peripheral insulin-
resistance and impaired glucose sensitivity of first-phase insulin secretion. On
the other hand, in overt type 2 diabetes mellitus beta-cell failure becomes fully
manifested. Progression from prediabetes to type 2 diabetes mellitus in youth
is characterized by marked weight gain and further reduction in insulin
secretion and insulin resistance.

Reverting obesity through lifestyle modification, that involves nutrition
education, behavior modification and exercise, is an important step to prevent
the progression to diabetes.

Sakurai H (2008) says the number of patients suffered from diabetes
mellitus has increased over the decades probably because of both lifestyle-
and diet-changes. There are two types of diabetes mellitus. Type 1 diabetes
mellitus is due to the autoimmune-mediated destruction of pancreatic B cells,
which results in absolute insulin deficiency, thus the patients require insulin
injections. Type 2 diabetes mellitus is due to the insulin resistance and
abnormal insulin secretion, thus the patients require exercise, diet control
and/or oral hypoglycemic medicines. Each treatment, however, has some
problems involving physical and mental burden, and formation of self-
antibodies for insulin injections, and the severe side effects and
discontinuation of insulin synthesis in the pancreas for hypoglycemic
medicines. To overcome these important problems and find the replacements
for the insulin injections and synthetic medicines, we attempted to develop
new antidiabetic metallocomplexes with novel structures and mechanisms. In
1990, they first presented orally active vanadyl (+4 oxidation state of oxo-
vanadium) complexes including vanadyl-cysteine methyl ester complex, which
normalized hyperglycemia in the streptozocin (STZ)-induced type 1 diabetic
rats. Based on these findings, we have developed a wide variety of vanadyl
complexes with different coordination environments around vanadyl ion.
Following the study, it was also challenged to develop orally active zinc
complexes since 2002. This review focuses on our recent development of
vanadyl and zinc complexes for anti-diabetic and anti-metabolic syndromes,
together with the propose for the possible action mechanism of these
complexes in adipocytes.

Skamagas M (2008) says diabetes mellitus is a prevalent disease that
affects millions of people worldwide and has paralleled the growing population
of overweight and obese individuals. Early detection of prediabetes and
diabetes, as well as lifestyle interventions including diet and exercise, are the
overarching objectives in preventing and managing diabetes. For individuals
who do not achieve glycemic control with lifestyle modification, there are
newer medication classes that assist with weight loss, more physiologic
insulins with convenient delivery systems, and old standbys like metformin
and thiazolidinediones. Glycemic control along with blood pressure and cholesterol management reduce microvascular and macrovascular disease including cardiovascular events. Mounting evidence demonstrates that diabetes is a risk factor for periodontitis and possibly oral premalignancies and oral cancer. The systemic inflammatory response generated by inflamed periodontal tissue may in turn exacerbate diabetes, worsen cardiovascular outcomes, and increase mortality. Thus, oral medical and surgical physicians are vital in treating oral pathology, recognizing new cases of diabetes, and counseling people with diabetes to promote oral health. This article presents updates in the diagnosis, risk factors, prevention, management, and peri-oral complications of diabetes to assist oral health professionals in providing optimal care to patients with diabetes.

Bagry HS (2008) says metabolic syndrome represents a constellation of risk factors associated with increased incidence of cardiovascular disease and progression to diabetes mellitus. Insulin resistance, a state of decreased biologic response to physiologic concentrations of insulin, is a key component of this syndrome and seems to be the result of a primary defect at the skeletal muscle glucose transporter. Acute illness and the perioperative period are characterized by a state of insulin resistance that manifests as hyperglycemia and leads to various other metabolic and biochemical alterations that adversely affect end organ function. Hyperglycemia in acutely ill patients adversely affects outcome. Achieving euglycemia seems beneficial in certain clinical situations, but considerable disagreement exists regarding the target blood sugar levels, the duration of therapy, and the modality.
Pharmacotherapy, exercise, and nutrition to improve insulin sensitivity seem promising but require further evaluation to confirm their efficacy for perioperative risk reduction. This review discusses the pathophysiology and the clinical implications of metabolic syndrome and insulin resistance in the acutely ill patient with an emphasis on perioperative modulation strategies.

Hoffman RP (2007) says in normal individuals hypoglycemic counterregulation is a multifactorial, redundant process that involves reduction of insulin secretion, increasing glucagon secretion, adrenergic activation, and increased growth hormone and cortisol secretion. Metabolically, these lead to increased glucose production, initially through glycogenolysis and later through gluconeogenesis, decreased muscle glucose oxidation and storage and increased release and use of alternative fuels, primarily free fatty acids. They also lead to hypoglycemic symptoms and hunger which increase food intake. These systems are designed to provide as much glucose as possible for brain glucose use. In patients with type 1 diabetes there are multiple impairments of these responses. Insulin does not decrease. Glucagon secretion is decreased or absent. Recovery from hypoglycemia is therefore dependent on the adrenergic response. Hypoglycemia increases plasma levels of both epinephrine and norepinephrine. These catechols are released primarily from the adrenal medulla. However, it is well documented that hypoglycemic increases muscle sympathetic nerve activity, and that both alpha and beta adrenergic activity increase. Increased beta-activity increases free fatty acid release which increase glucose production and decrease glucose utilization. The increased alpha-adrenergic activity's primary role is to
counteract beta-adrenergic vasodilation. It may also reduce neurogenic and neuroglycopenic symptoms. Lastly, there is evidence that both cardiac and adrenergic sensitivity are altered in type 1 diabetes. It is hoped that this information can be used in the future to help develop ways to protect patients with type 1 diabetes from hypoglycemia and its adverse effects.

Sivasankaran S (2006) says chronic stress is estimated to increase the risk of cardiovascular (CV) events two-fold. Although stress reduction has been linked to a reduction in CV events, little is known regarding its exact mechanism of benefit.

Yoga and meditation will improve parameters of endothelial function.

They examined the effects of Yoga and meditation on hemodynamic and laboratory parameters as well as on endothelial function in a 6-week pilot study. Systolic and diastolic blood pressures, heart rate, body mass index (BMI), fasting glucose, lipids, hs C-reactive protein (CRP), and endothelial function (as assessed by brachial artery reactivity) were all studied at baseline and after 6 weeks of Yoga practice.

Delahanty LM (2008) says the Diabetes Prevention Program (DPP) and Look AHEAD (Action for Health in Diabetes) trials are long-term randomized clinical trials that have the potential to direct diabetes care and medical nutrition therapy for obesity, prediabetes, and type 2 diabetes both now and in the future. This article summarizes and compares the important evidence-based results of these diabetes and obesity clinical trials and reviews the similarities and differences in lifestyle interventions that were
designed for these trials. Although there were many similarities in the features of the DPP and Look AHEAD interventions, the Look AHEAD lifestyle intervention was more ambitious in several ways: higher individual weight-loss goals, lower calorie and fat-gram targets based on initial body weight, more intensive intervention frequency, combining closed group and individual session format, and use of more structured nutrition intervention strategies from the outset, including meal replacements, structured menus, and combined fat and calorie counting. Evidence, knowledge, and insights gained from working on these clinical trials will be very important in determining the strategies, methods, and approaches needed to make sure that the results of these trials will be fully applied in real-world practice settings for obesity, prediabetes, and type 2 diabetes.

Mayer-Davis EJ (2008) says the type 2 diabetes mellitus has emerged as a diagnosis among adolescents in the United States, particularly among minority groups and concurrent with the well-documented epidemic of overweight and obesity. Opportunities for prevention of type 2 diabetes and approaches to optimized treatment regimens for adolescents with the disease have drawn largely from studies conducted in adult populations. Recognizing that much work remains to be done, this review summarizes key findings from recent research and highlights recent findings from large, ongoing studies of youth that address the prevalence and incidence of type 2 diabetes in young people, the prevalence of complications among this group, and the current knowledge base that informs opportunities for prevention and treatment of type 2 diabetes in adolescents.
Cummings S (2008) conducted a study obesity is associated with an increased risk of developing insulin resistance and type 2 diabetes. Development of type 2 diabetes can be delayed or sometimes prevented from manifestation in individuals with obesity that are able to lose weight. Weight loss can be achieved either medically with behavioral therapies that combine diet and exercise treatment or with behavioral therapies combined with weight-loss medications or weight-loss surgery. There is strong evidence of an amelioration or resolution of type 2 diabetes in patients undergoing gastric bypass surgery. A recently published retrospective cohort study indicated that long-term total mortality from diabetes, heart disease, and cancer after gastric bypass surgery was substantially reduced. In this review, they summarize the evidence of surgical interventions in the treatment of type 2 diabetes.

Fonseca VA (2008) says this article highlights the use of antidiabetic agents, including insulin. Medical nutrition therapy (MNT) and physical activity are the cornerstones of management of type 2 diabetes. The progressive nature of type 2 diabetes requires use of one or more oral agents and eventually insulin, along with MNT and physical activity. The American Association of Clinical Endocrinologists and the European Association for the Study of Diabetes have recommended a lower hemoglobin A1c target of <6.5%, and many health care providers strive to achieve normalization of blood glucose. Achievement of these goals often prompts providers to consider combination therapy to target different pathogenic mechanisms and manage both fasting and postprandial blood glucose levels. Maintenance of glycemic control over the lifespan of a patient with diabetes is overwhelmingly
likely to require combination therapy with oral diabetes medications. The UK Prospective Diabetes Study reported that <50% of patients maintained glycemic control on MNT or monotherapy with oral agents at 3 years, and that number dropped to <25% at 9 years. Newer agents and insulins have become available since the UK Prospective Diabetes Study was completed and have enhanced our armamentarium of therapeutics for treatment of diabetes.

Shoal and others (1998) conducted the study on effects of 18 week training on some biochemical, physiological and morphological parameters of Indian Inter-University football players. The twelve Indian Inter-University male football players were under study for 18 week of training camp. Significant variation in the level of triglyceride was seen at different levels of training. There was significant rise and fall in triglyceride level in the blood of football players. Significant fall in the cholesterol level of these players was observed. Improvement in VO$_2$ max after six weeks of training was recorded. Significant loss in the body fat was seen in all the players after 18 weeks training but more loss was recorded among forward line players.

H.N Williford (1988) and others evaluated ten healthy untrained females (Mean age 23 years) to determine the effects of 10 weeks of aerobic dance training on plasma lipid and lipoprotein levels, cardio respiratory function and body composition. A control group of eight untrained females (mean age 26 years) underwent the same evaluation procedures as the training group, testing blood samples, collected pre and post training group, were assayed. It was concluded that 10 weeks of aerobic dance training can significantly improve cardiovascular fitness independent of changes in
serum lipids, lipoproteins or body composition. Education programme and the other was given both, 16 Asanas and suriyanamaskar were given. The period of training was 10 weeks. He found out that combination of Yoga (Asanas) and physical education produce best results in increasing lean body mass, reduction in fat percentage and reduction in body weight.

Chinnasamy (1992) conducted a study on effect of asanas and physical exercise on selected physiological and bio-chemical variables among school boys. In this study ninety male students were randomly selected from Government higher secondary school, Thammampatti. The initial scores were measured for the selected physiological and bio-chemical variables, namely pulse rate, systolic blood pressure, diastolic blood pressure, haemoglobin content and blood sugar level. The treatment was given for a period of six weeks for the experimental groups. The significance of the difference among two means of exercise group and asana group for the pre- test and post- test mean gains were determined by f-ratio through analysis of variance. Asanas and physical exercises have significantly improved the haemoglobin content, blood sugar, pulse rate and diastolic pressure. There was no difference in systolic pressure in which either physical exercise group or asana group made no effect.

Chelladurai (1992) conducted a study on the effect of selected yogic practices and blood cholesterol among sedentary businessmen and government employees of Aranthangi town. For the purpose of the study 80 subjects’ age group ranging from 35 to 45 were selected. The investigator selected blood cholesterol as the variable. t-test was used for the statistical
technique. It was found that yogic practices decreased the blood cholesterol level.

2.5 STUDIES ON PSYCHOLOGICAL VARIABLES

Radha (1991) conducted a study on psychological factors and soccer performance of south India University players.

Modern sport training gives greater emphasis. On preparing the athletes psychologically than psychologically through both plays revealed that apart from somatic and psychological variables, higher level of performance is dependent upon athletes’ psychological make up. In these study psychological factors, namely competition, anxiety and aggressiveness were studied in related to soccer playing ability. Accordingly 100 South Indian Inter University Soccer players form the states of Tamil Nadu, Kerela, AndraPradesh and Karnataka were selected. Sports competition Anxiety Test (SCAT) questionnaire and aggressiveness questionnaire (AQ) developed by Rajher, Martens and Smite to measure the anxiety rated the Soccer playing ability on the subjects (0.10.10. Point scale). The obtained factors on the psychological factors were correlated with Soccer playing ability using Pearson’s product moment correlation and partial correlation to eliminates the influence of the third variable.

Hasrani (1991) conducted a study on pre-competition anxiety of basketball players and track and field athletes. A sample of 25 basketball players and 22 Athletes were administered sports competition. Anxiety test questionnaire (SCAT martens 1977) a day prior to their department for the
competition. Results showed insignificant difference in anxiety level of basket ball and track and field athletes. It was also revealed that basket balers had better experience in coping with pre-competition anxiety than the track and field athletes.

Genvchi (1981) conducted a study sought to determine the relationship between competitive trait anxiety (CTA) state anxiety and golf performance in a field setting. 10 moderate and high QTA collegiate golfers (N = 30) performed in a practice round on day low day low day 2 of a competitive tournament, state anxiety results indicated a significant QTA main object, with 10 W CTA subjects displaying lower state anxiety than moderate or high CTA subjects. The competition main effect was also significant with post-hoc tests indicating levels of state anxiety during day 19 W days then during the practice round. Performance results produced significant CTA MAIN effect with 10 W CTA subjects displaying higher levels of performance than moderate or high CTA subjects. Correlation between SCAT state anxieties indicated that SCAT was a good predictor of pre-competitive state anxiety.

Mannan and Bala (1980) examined pre-competition anxiety footballers at various stages competition. One hundred seventy six football players from eleven Universities who has tendency to work at higher level of anxiety in consonance with the demand of the game.

Parthasarathy conducted (1993) “A comparative study of anxiety stress and achievement motivation of basketball, volleyball and football players.” The purpose was to compare anxiety, stress and achievement motivation of
basket ball, volley ball and foot ball players. Seventy six Madras University
players of volley ball, foot ball and basketball aged between eighteen to
twenty five years ware selected as the subjects. Spielbergger’s. Questionnaire
was adopted to find out the anxiety level T- test was computed to find out the
significance. The result of this study showed that there was no significant
difference shown among players of volley ball, foot ball and basket ball.

Alexander GK (2008) provides a review of literature both to identify the
effects of Yoga-based therapy on the management of type 2 diabetes mellitus
and to examine the social context of physical activity. Findings from the
review indicate that Yoga has a positive short-term effect on multiple
diabetes-related outcomes; however, long-term effects of Yoga therapy on
diabetes management remain unclear. The context of the social environment,
including interpersonal relationships, community characteristics, and
discrimination, influences the adoption and maintenance of health behaviors
such as physical activity, including Yoga practice. Further research is
necessary to determine the extent of this influence.

Gordon LA (2008) says Yoga has been shown to be a simple and
economical therapeutic modality that may be considered as a beneficial
adjuvant for type 2 diabetes mellitus. This study investigated the impact of
Hatha Yoga and conventional physical training (PT) exercise regimens on
biochemical, oxidative stress indicators and oxidant status in patients with
type 2 diabetes. This prospective randomized study consisted of 77 type 2
diabetic patients in the Hatha Yoga exercise group that were matched with a
similar number of type 2 diabetic patients in the conventional PT exercise and control groups. Biochemical parameters such as fasting blood glucose (FBG), serum total cholesterol (TC), triglycerides, low-density lipoprotein (LDL), very low-density lipoproteins (VLDL) and high-density lipoprotein (HDL) were determined at baseline and at two consecutive three monthly intervals. The oxidative stress indicators (malondialdehyde - MDA, protein oxidation - POX, phospholipase A2 - PLA2 activity) and oxidative status [superoxide dismutase (SOD) and catalase activities] were measured.

The study demonstrate the efficacy of Hatha Yoga exercise on fasting blood glucose, lipid profile, oxidative stress markers and antioxidant status in patients with type 2 diabetes and suggest that Hatha Yoga exercise and conventional PT exercise may have therapeutic preventative and protective effects on diabetes mellitus by decreasing oxidative stress and improving antioxidant status.

Shailaja Mohan (1991) and others conducted a study to find out the pre-competition anxiety on high and low achieving female track and field athletics. The subjects were 48 female track and field athletes who participated in Kerela University Intercollegiate Athletic meet. Those who have participated National level and all India Inter University level were considered high achievers and those at collegiate and district level considered as how achievers and those at collegiate and employing sports competition. Anxiety test (Marten, 1977) one hour prior to the competition of achievement and maximum level of participation were also need. Results
showed the high and low achieving track and field female athletes of inter
collegiate level do not differ in competition anxiety.

Vincent Floyd (1977) performed an experiment to investigate the effect
of sports involvement on self concept. The experimental group participated in
basket-ball and wrestling for thirty consecutive days. Pre and post test were
conducted to both experimental and control groups. The data derived from the
experiment was statistically analysed. The results revealed that no statistically
significant was found among experimental groups on self concept as a result
of sports involvement.

Ibrahim and Morrison (1982) compared the self actualization and self
concept among athletes. It was measured by Tennessee self concept scale.
The subjects were 100 athletes representing men and Klomen from both
school and college were composed to 100 non athletes in their self concept
and self actualization traits. In general athletes were found to be average in
their self concept, while male high school athletes differ to some extent from
the non Athletes in both self concept and self actualization.

Finken berg et. al., (1992) conducted a study on self concept. In this
study 41 females and 36 males cheer leaders participating in a national
collegiate championship competition completed the competitive state
University ( C + A> A) and somatic state anxiety ( SSA) negative correlation
were found between self- confidence and both C.S.A and S.S.A.A canonical
discriminate analysis shows the terms could be accomplished by a subject
Clayton (1970) conducted an experimental study for investigating the self concept, ideal self concept body image and movement concept of college students using actually questionnaire, anthropometrics measurements and three question start assessing self body and movements concept and coopers. 12 minutes field test, he calculated that no significant relationship between three components among college students.