REVIEW OF LITERATURE

A synthesis of existing published writings that describes what is known or has been studied regarding the particular research question/purpose. (Carol L. Macnee, 2004)

2.1 Review of Research Studies are presented under 3 headings:

I. Studies related to Curry Leaf and diabetes mellitus,
II. Studies related to Amla and diabetes mellitus,
III. Studies related to diabetes mellitus on selected variables.

I. STUDIES RELATED TO CURRY LEAF AND DIABETES MELLITUS,

Anil Kumar Saxena (2018) Conducted a study on The Antidiabetic Activity of Curry Leaves “MurrayaKoenigii” on the Glucose Levels, Kidneys, and Islets of Langerhans of Rats with Streptozotocin Induced Diabetes. The aims of this study were to explore the antihyperglycemic effect of curry leaves, Murrayakoenigii "MK" aqueous extract, and to examine its possible protective effects on the islets of Langerhans and kidneys of streptozotocin (STZ) diabetic rats. Methods: Thirty healthy adult male Sprague Dawley rats were randomized into five groups (n=6); normal control, normal treated with "MK" control, diabetic control (non-treated with "MK"), diabetic treated with 200 mg/kg MK aqueous leaf extract and diabetic treated with 400 mg/kg MK aqueous leaf extract. Blood glucose levels and body weight were monitored gravimetrically. The animals were sacrificed on the 30th day; the kidney and pancreatic tissues were processed for histological studies. Results: The diabetic group showed considerable loss of body weight and increase in blood glucose levels and degeneration of the glomeruli and renal convoluted tubules and atrophied islets with disintegration of β-cells. Treatment of diabetic rats with MK extract showed significant (p < 0.001) improvement in blood glucose levels and body weight gain.
The MK extract also caused an improvement in tissue injury induced by STZ injection in the kidney and islets of Langerhans. Conclusions: These findings highlighted the beneficial effects of MK aqueous extract against cellular oxidative damage in STZ-induced diabetic rats.

Gomathi, K N (2016) Conducted A study to assess the effectiveness of curry leaves in reducing blood sugar among type II diabetes clients in selected rural areas at Medavakkam, Chennai India leads the world with largest number of diabetic subjects earning the dubious distinction of being termed the "diabetes capital of the world". Methodology: Research approach: quantitative research approach Study Setting: The study was conducted in rural area of Medavakkam, Chennai. Research design: experimental study, pre testpost test only design Sampling technique: simple random sampling technique Sample size : In this study the sample comprises of 60 Type-II Diabetic adults in which 30 clients were in experimental and 30 were selected in the control group. Data collection procedure: The investigator selected 60 samples (30 participants in experimental and 30 in control group) by simple random sampling technique using lottery method. Pre testof post-prandial blood glucose level was assessed by glucometer for both experimental and control group, same instrument was used for both the group and then for the experimental group 10gm of curry leaves powder was given with food , morning/ daily in person for 14 days post assessment was conducted on the 15th day for both experimental and control group. Data analysis The data were analyzed with descriptive statistics like mean, and standard deviation. Inferential statistics like chi-square test, independent t-test were used to analyze the clinical variables. p value of <0.05 was considered statistically significant. Discussion: On comparing the pre and post blood glucose level among Type II Diabetic patients in experimental group and control group, the obtained mean difference were 10.44% and 0.76% respectively. The finding implies that there is a significant difference between the pre and post- prandial blood sugar level in experimental group. Thus the hypothesis was proved. Conclusion: The study was concluded with the findings that there is a significant reduction in blood sugar level of clients in experimental group who were given 10gms of curry leaves powder for 14 days along with their food.
II. STUDIES RELATED TO AMLA AND DIABETES MELLITUS,

Krishnamoorthy VK, (2018) Conducted a study on Protective effects of Emblicaofficinalis (Amla) on metal-induced lipid peroxidation in human erythrocytes. Protective potential of Emblicaofficinalis (amla) was investigated on metal-induced lipid per oxidation in human erythrocytes. Increases in the levels of MDA and catalase activity were assessed as lipid per oxidation. In addition, glutathione peroxidase (GPX), glutathione (GSH), and ascorbic acid levels were assessed as antioxidant indices. Preliminary investigation of the extract exhibited a significant reduction in lipid per oxidation and an increase in antioxidant abilities, such as a decrease in MDA, GPx and GSH (P<0.05). A significant reduction in erythrocyte hemolysis induced by hydrogen peroxide was observed using amla extract (P<0.05). These findings show that amla extract has significant protective potential against lipid per oxidation.

Yamamoto H, (2016) Conducted a study on Amla Enhances Mitochondrial Spare Respiratory Capacity by Increasing Mitochondrial Biogenesis and Antioxidant Systems in a Murine Skeletal Muscle Cell Line. Amla is one of the most important plants in Indian traditional medicine and has been shown to improve various age-related disorders while decreasing oxidative stress. Mitochondrial dysfunction is a proposed cause of aging through elevated oxidative stress. In this study, we investigated the effects of Amla on mitochondrial function in C2C12 myotubes, a murine skeletal muscle cell model with abundant mitochondria. Based on cell flux analysis, treatment with an extract of Amla fruit enhanced mitochondrial spare respiratory capacity, which enables cells to overcome various stresses. To further explore the mechanisms underlying these effects on mitochondrial function, we analyzed mitochondrial biogenesis and antioxidant systems, both proposed regulators of mitochondrial spare respiratory capacity. We found that Amla treatment stimulated both systems accompanied by AMPK and Nrf2 activation. Furthermore, we found that Amla treatment exhibited cytoprotective effects and lowered reactive oxygen species (ROS) levels in cells subjected to t-BHP-induced oxidative stress. These effects were accompanied by increased oxygen consumption, suggesting that Amla protected cells against oxidative stress by using enhanced spare respiratory capacity to produce more energy. Thus we identified protective effects of Amla, involving
activation of mitochondrial function, which potentially explain its various effects on age-related disorders.

Fazal F, (2016) Conducted a study on Anti-diabetic effects of the Indian indigenous fruit EmblicaofficinalisGaertn: active constituents and modes of action. Dietary constituents are shown to play an important role in the development of diabetes. Studies have shown that the fruits of EmblicaofficinalisGaertn or Phyllanthusemblica Linn, colloquially known as Indian gooseberry or amla and/or some of its important constituents (including gallic acid, gallotannin, ellagic acid and corilagin), possess anti-diabetic effects through their antioxidant and free radical scavenging properties. Amla has also been reported to prevent/reduce hyperglycemia, cardiac complications, diabetic nephropathy, neuropathy, cataractogenesis and protein wasting. However, clinical trial data with human subjects are limited and preliminary. For the first time this review summarizes the anti-diabetic affects of amla and also addresses the mechanisms mediating these properties.

Baliga MS, (2015) Conducted a study on Amla (EmblicaofficinalisGaertn), a wonder berry in the treatment and prevention of cancer. EmblicaofficinalisGaertn. or Phyllanthusemblica Linn, commonly known as Indian gooseberry or amla, is arguably the most important medicinal plant in the Indian traditional system of medicine, the Ayurveda. Various parts of the plant are used to treat a range of diseases, but the most important is the fruit. The fruit is used either alone or in combination with other plants to treat many ailments such as common cold and fever; as a diuretic, laxative, liver tonic, refrigerant, stomachic, restorative, alterative, antipyretic, anti-inflammatory, hair tonic; to prevent peptic ulcer and dyspepsia, and as a digestive. Preclinical studies have shown that amla possesses antipyretic, analgesic, antitussive, antiatherogenic, adaptogenic, cardioprotective, gastroprotective, antianemia, anti-hypercholesterolemia, wound healing, anti-diarrheal, anti-atherosclerotic, hepatoprotective, nephroprotective, and neuroprotective properties. In addition, experimental studies have shown that amla and some of its phytochemicals such as gallic acid, ellagic acid, pyrogallol, some norsesquiterpenoids, corilagin, geraniin, elaeocarpusin, and prodelphinidins B1 and B2 also possess antineoplastic effects. Amla is also reported to possess radiomodulatory, chemomodulatory, chemopreventive effects, free radical scavenging, antioxidant, anti-inflammatory, antimutagenic and immunomodulatory
activities, properties that are efficacious in the treatment and prevention of cancer. This review for the first time summarizes the results related to these properties and also emphasizes the aspects that warrant future research to establish its activity and utility as a cancer preventive and therapeutic drug in humans.

Harpreet Singh Grover (2015) Conducted a study on Therapeutic effects of amla in medicine and dentistry: 2015 Emblicaofficinalis (Amla) is widely used in the Indian system of medicine and believed to increase defense against diseases. Amla is called amalaki in Sanskrit. It is one of the oldest oriental medicines mentioned in Ayurveda as potential remedy for assorted ailments. A wide range of phytochemical components present in amla including alkaloids, tannins, and flavonoids have been shown to procure useful biological activities. It is an ingredient of many Ayurvedic medicines and tonics as it removes excessive salivation and internal body heat. Research has been done with amla evaluating its role as an antioxidant. Amla is useful in ulcer prevention, for diabetic patients, and for memory effects. Amla Tonic has a hematinic and lipalytic function useful in scurvy, prevents indigestion, and controls acidity as well as it is a natural source of anti-aging.

Akhtar MS, (2014) Conducted a study on Effect of Amla fruit (EmblicaofficinalisGaertn.) on blood glucose and lipid profile of normal subjects and type 2 diabetic patients. The present study evaluated the anti-hyperglycemic and lipid-lowering properties of EmblicaofficinalisGaertn. fruit in normal and diabetic human volunteers. The results indicated a significant decrease (P < 0.05) in fasting and 2-h post-prandial blood glucose levels on the 21st day in both normal and diabetic subjects receiving 1, 2 or 3 g E. officinalis powder per day as compared with their baseline values. Significant (P < 0.05) decreases were also observed in total cholesterol and triglycerides in both normal and diabetic volunteers on day 21 that were given either 2 or 3 g E. officinalis powder per day. However, diabetic volunteers receiving only 3 g E. officinalis powder exhibited a significant (P < 0.05) decrease in total lipids on day 21. Both normal and diabetic volunteers receiving 2 or 3 g E. officinalis powder significantly (P < 0.05) improved high-density lipoprotein-cholesterol and lowered low-density lipoprotein-cholesterol levels.
Anil Sharma, (2014) The researcher aims to assess the efficacy of combination of fenugreek, amla and turmeric powder to reduce blood glucose level among diabetics. Multiple databases were searched focusing on natural remedies such as combination of fenugreek, amla and turmeric powder help to reduce blood glucose level.

III . STUDIES RELATED TO DIABETES MELLITUS ON SELECTED VARIABLES.

H Hirpara, (2019) The effect of bitter melon (Momordica charantia) in patients with diabetes mellitus: a systematic review and meta-analysis. Momordica charantia (bitter melon) has been investigated for lowering plasma glucose in patients with diabetes mellitus (DM). Study selection, data extraction and validity of each article were independently assessed by two investigators. Articles were appraised for proper random sequence generation, allocation concealment, blinding, selective reporting and completeness of outcomes reporting to assess the risk for biases. The glycemic results of each RCT were analyzed to yield weighted mean differences (WMDs) and 95% confidence intervals (CIs). A total of four RCTs, each with 40–66 participants, followed between 4 and 12 weeks were identified in this meta-analysis. Overall risk of bias for each article included was determined to be unclear. In total, 208 participants with type 2 DM (mean age of 56.5 years) were evaluated. Compared with no treatment, bitter melon did not significantly lower A1C (WMD = 0.13%, 95% CI = 0.41 to 0.16) nor fasting plasma glucose (FPG) 47 (WMD 2.23 mg dl\(^{-1}\), 95% CI = 14.91 to 19.37). Bitter melon supplementation compared with no treatment did not show significant glycemic improvements on either A1c or FPG.

Baby Joseph and D Jini (2018) Conducted a study on Antidiabetic effects of Momordica charantia (bitter melon) and its medicinal potency Diabetes mellitus is among the most common disorder in developed and developing countries, and the disease is increasing rapidly in most parts of the world. It has been estimated that up to one-third of patients with diabetes mellitus use some form of complementary and alternative medicine. One plant that has received the most attention for its anti-diabetic properties is bitter melon, Momordica charantia (M. charantia), commonly referred to as bitter gourd, karela and balsam pear. Its fruit is also used for the
treatment of diabetes and related conditions amongst the indigenous populations of Asia, South America, India and East Africa. Abundant pre-clinical studies have documented in the anti-diabetic and hypoglycaemic effects of M. charantia through various postulated mechanisms. However, clinical trial data with human subjects are limited and flawed by poor study design and low statistical power. The present review is an attempt to highlight the antidiabetic activity as well as phytochemical and pharmacological reports on M. charantia and calls for better-designed clinical trials to further elucidate its possible therapeutic effects on diabetes.

Kaushal Parmar, (2018) Conducted a study on Effects of bittergourd (MomordicaCharantia) fruit juice on glucose tolerance and lipid profile in type-I diabetic rats Bitter melon (Momordicacharantia) or bittergourd commonly known as karela, (family: Cucurbitaceae), has been proved for hypoglycaemic effects. The objective of the present study was to evaluate effects of bittergourd (momordicacharantia) fruit juice on glucose tolerance and lipid profile in streptozotocininduced type-II diabetic rat. Two days old neonatal pups (7–10 g) were used & they were made diabetic by intraperitoneally (i.p.) injection of 90 mg/kg STZ in citrate buffer solution. Different groups of animals were treated by 25% and 50% bitter gourd fruit juice (BFJ) for 8 weeks. After 8 weeks treatment biochemical parameters from blood serum were analyzed. The significant differences of glucose, cholesterol, HDL, LDL, triglyceride, in 50%BFJ treated group compare to diabetic group were found. So, from present study it is concluded that Bitter gourd fruit juice has beneficial effects on glucose tolerance and lipid profile in streptozotocin-induced type-II diabetic rat.

Farhan Saeed, (2017) Conducted a study on Bitter melon (Momordicacharantia): a natural healthy vegetable Bitter melon provides health benefits against various ailments for improving the quality of life. It is nutrient dense plant-based food containing versatility of bioactive compounds such as alkaloids, polypeptide, vitamins, and minerals. Owing to presence of bioactive compounds, it has the ability to fight against various lifestyle related disorders, e.g. cancer insurgence, diabetes mellitus, abdominal pain, kidney (stone), fever, and scabies. Amongst bioactive moiety, p-insulin is similar to insulin whose subcutaneous injection significantly lower blood glucose levels in diabetic patients. It also contains
steroidal saponins called charantin, act alike peptides and certain alkaloids that effectively control sugar level in blood. The therapeutic perspectives have been also highlighted as they are helpful in regulating blood cholesterol thus protecting the body from cardiovascular disorders like atherosclerosis. Whole fruit, seeds and leaves of bitter melon regulates impaired antioxidant status and suppress fat accumulation. Moreover, curative potential of its bioactive components and their utilization in value added food products are also the limelight of article.

Kassaian N (2016) Conducted a study on Effect of fenugreek seeds on blood glucose and lipid profiles in type 2 diabetic patients. Recently use of herbal medicines, have been considered as an alternative for therapeutic usage. So, this study was undertaken to evaluate the hypoglycemic and hypolipidemic effects of fenugreek seeds in type 2 diabetic patients. In a clinical trial study, 24 type 2 diabetic patients were placed on 10 grams/day powdered fenugreek seeds mixed with yoghurt or soaked in hot water for 8 weeks. Weight, FBS, HbA(1)C, total cholesterol, LDL, HDL and food record were measured before and after the study. The differences observed in food records, BMI and serum variables were analyzed using paired-t-test and t-student and P<or=0.05 was considered as significant. After exclusion of 6 cases for changing in medication or personal problems, the results of 18 patients (11 consumed fenugreek in hot water and 7 in yoghurt) were studied. Findings showed that FBS, TG and VLDL-C decreased significantly (25 %, 30 % and 30.6 % respectively) after taking fenugreek seed soaked in hot water whereas there were no significantly changes in lab parameters in cases consumed it mixed with yoghurt. BMI, Energy, Carbohydrate, Protein and fat intake remained unchanged during study.

ArpanaGaddam ,(2015) Conducted a study on Role of Fenugreek in the prevention of type 2 diabetes It is hypothesized that dietary supplementation with Fenugreek modulates glucose homeostasis and potentially prevents diabetes mellitus in people with prediabetes. The objective of present study is to determine whether Fenugreek can prevent the outcome of T2DM in non diabetic people with prediabetes. A 3-year randomized, controlled, parallel study for efficacy of Fenugreek (n = 66) and matched controls (n = 74) was conducted in men and women aged 30–70 years with criteria of prediabetes. Fenugreek powder, 5 g twice a day before meals, was given to study subjects and progression of type 2 diabetes mellitus (T2DM) was
monitored at baseline and every 3 months for the 3-year study. By the end of intervention period, cumulative incidence rate of diabetes reduced significantly in Fenugreek group when compared to controls. The Fenugreek group also saw a significant reduction in fasting plasma glucose (FPG), postprandial plasma glucose (PPPG) and low density lipoprotein cholesterol (LDLc) whereas serum insulin increased significantly. It was observed that controls had 4.2 times higher chance of developing diabetes compared to subjects in the Fenugreek group. The outcome of diabetes in Fenugreek group was positively associated with serum insulin and negatively associated with insulin resistance (HOMA IR).

ManjiriRanade and Nikhil Mudgalkar (2015) Conducted A simple dietary addition of fenugreek seed leads to the reduction in blood glucose levels: A parallel group, randomized single-blind trial. Assessment of impact of ingestion of Trigonellafoenum-graecum fenugreek seed in patients with Type 2 diabetes controlled with OHAs and insulin on fasting blood sugar levels and HbA1C levels. Prospective, randomized control trial in a single center. Total sixty patients of Type 2 diabetes mellitus diagnosed at least 6 months prior and on OHAs and insulin were included in the study. Patients were randomized to receive 10 gm of fenugreek seeds soaked in hot water and another group was not. Strict dietary and exercise controls were followed as per the guidelines of American Diabetic Association protocols. The parameters assessed were demographic profile on the first visits and fasting blood sugar levels and HbA1C every month till 6 months. A total of sixty patients were enrolled in the study divided into two groups each containing thirty patients. One group of patients received 10 gm of fenugreek seeds soaked in hot water every day, while the second group did not received. Statistical analysis shows that there is significant reduction in fasting blood glucose levels in the 5th month in the study group (P = 0.0421) while significant reduction in HbA1C in the 6th month (P = 0.0201).

Nivethitha (2014) Conducted a study on A Narrative Review on Evidence-based Antidiabetic Effect of Fenugreek (TrigonellaFoenum-Graecum) Diabetes mellitus is one of the most common endocrine metabolic disorders. Adverse effects of the conventional antidiabetic therapy are increasing. Many herbs have strong
antidiabetic properties, and fenugreek is one among them. Although fenugreek is one of the most common herbs used for diabetes, its antidiabetic effects are not well-documented. The aim of this review was to report the evidence-based antidiabetic effects of fenugreek. We performed PubMed/Medline search to review relevant articles in English literature using keywords “Trigonellafoenumgraecum for the management of diabetes.” Out of 26 articles found, 18 articles were reported in this review. Based on the available literature, this review suggests that the fenugreek has the evidence-based antidiabetic effect, such as stimulating and/or regenerating effect on β cells along with the extrapancreatic effect, that is effective in reducing blood glucose levels in diabetic patients.

**ManmeetKaur, NarinderSingh (2014)** Conducted a study the efficacy and tolerability of fenugreek seed powder as add-on therapy with metformin in patients of type-2 diabetes mellitus. Fenugreek, an ancient herb has been known for its culinary and medicinal value in Indian Subcontinent. Its seeds, rich in fibers and phytochemical compounds, have been investigated for their hypoglycemic and multiple benefits. This study was thus undertaken to assess the anti-hyperglycemic effect of fenugreek seeds in patients of Type 2 Diabetes Mellitus (DM) as add-on therapy with metformin. Methods: An open-labelled comparative study of 12 weeks duration was conducted on patients (randomly divided in 2 groups of 30 each) of Type 2 DM. Group 1 was given metformin 500 mg twice a day while group 2 was given 500 mg of metformin along with fenugreek seed powder capsule,1 gm thrice a day. Weekly evaluation for fasting and post-prandial blood sugar was done. HbA1c estimation was done at the beginning and at the end of the study. Student’s t-test (paired and unpaired) was applied for statistical analysis. Results: After 12 weeks of treatment, there was significant fall in fasting, as well as postprandial blood sugar and HbA1c levels in group 1 and group 2. However this improvement was statistically more significant in group 2 when compared to group 1.

**MehedeeHasan (2012)** Conducted a study on Effects of fenugreek seed powder on stress-induced hyperglycemia and clinical outcomes in critically ill patients: A randomized clinical trial Materials: The study herein was a parallel, randomized controlled clinical trial consisting of 60 adult patients randomly divided into 2 groups (n=30 per group). The study was conducted in Sabzevar, Iran in April
2015. The intervention group received 3 g of fenugreek seed powder by gavage, twice a day, in addition to routine care. The control group received only routine care. In the beginning, a daily evaluation of fasting and postprandial blood sugar was conducted for 10 days. Secondary components (prevalence of pneumonia; length of intensive care unit (ICU) stay, length of hospital stay, ventilator days, APACHE II score, and mortality rate) were measured until the time of hospital discharge or death. Data were analyzed via SPSS v.20 using Student's t-test (paired and unpaired), chi-square test, repeated measure ANOVA, and Wilcoxon test. Results: In during 10 days of treatment, there was a significant fall in mean glucose levels in 2 groups. However, this improve was more significant in Intervention group in compared to control group (p<0.001).

Mustafizur (2011) Conducted a study on Effect of Fenugreek on Type2 diabetic patients. In this study we tried to develop an optimum amount of dose and a effective as well as convenient dosage form of fenugreek seed and to observe its’ effect on type2 diabetic patient. At the same time, we also tried to find out stability of fenugreek seed through preserving it into pure water. We also focused on any change of effect while boiled or unboiled seed solution administered to the type2 diabetes affected patients.

PangiVijayaNirmala, (2011) Conducted a Comparative Study of the Prevalence of Type-2 Diabetes Mellitus in Various Demographic Regions of Andhra Pradesh, India: a Population based Study. Diabetes is increasing at alarming rate among Indians especially South Indians with prevalence of diabetes mellitus (PODM) varying in populations of different regions. This study assesses PODM in three geographical areas, namely: tribal, semi-urban, and urban, and to compare the diabetes risk in northern coastal districts of Andhra Pradesh state in India. Methodology: A random sampling method was followed to study the prevalence of diabetes in about 3,000 individuals of age group between 15-68 years, selecting 1,000 individuals from each area. As per 1988 World Health Organization criteria and norms, diabetes mellitus was diagnosed on the basis of 75-g oral glucose tolerance test (OGT). Statistical analyses were conducted using Microsoft Excel 2007. Results: The analysis of the study indicates that 35.5% individuals were identified to be
diabetic, especially 7.8% from Tribal area, 12.5% from semi-urban and 15.1% from urban area.

Lee W (2010) Conducted a Comparative study of diabetes mellitus resolution according to reconstruction type after gastrectomy in gastric cancer patients with diabetes mellitus. This study was conducted to investigate diabetes mellitus (DM) resolution after gastrectomy according to reconstruction type in gastric cancer patients. Two hundred twenty-nine gastric cancer patients with DM who underwent gastrectomy with curative intent from May 2003 to December 2009 were enrolled. Changes in fasting blood sugar concentration and the dosage of oral hyperglycemic agents or insulin were compared between reconstruction types. The numbers of patients who underwent distal gastrectomy with a Billroth I (BI), Billroth II (BII), Roux-en-Y gastrojejunostomy (RYGJ), or total gastrectomy with Roux-en-Y esophagojejunostomy (RYEJ) were 119 (51.7%), 54 (23.5%), 40 (17.4%), and 16 (6.9%), respectively. DM remitted in 45 (19.7%) patients: 18 BI patients (15.1%), 11 BII patients (20.3%), 8 RYGJ patients (20.0%), and 8 RYEJ patients (50.0%). DM improved in 85 (37.1%) patients: 41 BI patients (34.4%), 25 BII patients (46.2%), 15 RYGJ patients (37.5%), and 4 RYEJ patients (25.0%). The DM remission or improvement rate was higher in the duodenal bypass group (BII, RYGJ, RYEJ) than in the BI group (67.2% vs. 49.5%, P = 0.022), and the DM remission rate was higher in the RYEJ group than in the distal gastrectomy group (50.0% vs. 17.3%, P = 0.002).

Fuller MA (2009) Conducted a Comparative study of the development of diabetes mellitus in patients taking risperidone and olanzapine. We conducted a retrospective analysis of the Veteran's Integrated Service Network 10 Veterans Affairs (VA) database. Data for patients receiving olanzapine, risperidone, haloperidol, or fluphenazine from January 1, 1997-December 31, 2000, were included. Diabetes was defined as any health system encounter associated with the International Classification of Diseases, Ninth Revision, Clinical Modification diagnosis for diabetes (250.xx) or prescription for a hypoglycemic agent. Data of patients with markers for diabetes within 1 year before their index date, female patients, racial groups other than Caucasian or African-American, and patients receiving clozapine were not analyzed. We performed a Cox regression, with antipsychotic therapy as a time-dependent covariate. Other covariates considered for
inclusion in the final model were number of days supply of antipsychotic drug, age, race, psychiatric diagnoses, substance abuse, lithium, valproic acid, and other typical or atypical antipsychotic agents. Data for 5837 patients were analyzed. Overall rate of developing diabetes in the study population was 6.3% (368 of 5837 patients). Olanzapine therapy was associated with a significantly higher risk of development of diabetes compared with risperidone (hazard ratio [HR] 1.37, 95% confidence interval 1.06-1.76, p=0.016) while controlling for race, age, diagnosis, substance abuse, lithium, valproic acid, and other atypical antipsychotic agents. No differences in the rate of developing diabetes were detected between fluphenazine and risperidone (HR 1.11, p=0.69), or haloperidol and risperidone (HR 0.89, p=0.41).

Daklallah A (2007) Conducted a Comparative Study on the Influence of Some Medicinal Plants on Diabetes Induced by Streptozotocin in Male Rats. Medicinal plants have played an important role in the treatment of many diseases. Medicinal plants are believed to be well appropriate with the human body and to produce less side influences than the pharmaceuticals. Kingdom of Saudi Arabia has abundant and wide variety of medicinal plants whose therapeutic effects have not been adequately studied. The aim of this study was to investigate the hypoglycemic activities of the extracts of three plant species collected from Albaha region of Saudi Arabia including Olea oleaster (Oleaceae family) leaves (OLE), Juniperus procera (Cupressaceae family) leaves (JLE), and Opuntia ficus-indica (Cactaceae family) stems (OSE) on streptozotocin (STZ) diabetic male rats. The animals were distributed into eight groups. The first group was used as normal control. The second group was diabetic control. Diabetic rats of the third, fourth, and fifth groups were supplemented with OLE, JLE, and OSE, respectively. Normal rats of the sixth, seventh, and eighth groups were treated with OLE, JLE, and OSE, respectively. As expected, the mean of body weight was significantly decreased in rats of the second group. Significant increase in the value of serum glucose and decline of insulin value were observed in rats of the second group. Several alterations of lipid and protein profile and oxidative stress markers were noted in diabetic control rats. Severe histopathological alterations of pancreatic tissues were observed in untreated diabetic rats. The obtained results showed that OLE, JLE, and OSE attenuated the physiological and histopathological alterations. These new data indicate that the
attenuation influences of OLE, JLE, and OSE attributed to their antioxidant properties confirmed by oxidative stress markers evaluation.

Daniala L. Weir, (2007) Conducted a Comparative Safety and Effectiveness of Metformin in Patients With Diabetes Mellitus and Heart Failure. We conducted a comprehensive search for controlled studies, evaluating the association between metformin and morbidity and mortality in people with diabetes mellitus and HF. Two reviewers independently identified citations, extracted data, and evaluated quality. Risk estimates were abstracted and pooled where appropriate. As measures of overall safety, we examined all-cause mortality and all-cause hospitalizations. Nine cohort studies were included; no randomized controlled trials were identified. Most (5 of 9) studies were published in 2010 and were of good quality. Metformin was associated with reduced mortality compared with controls (mostly sulfonylurea therapy): 23% versus 37% (pooled adjusted risk estimates: 0.80; 0.74–0.87; \( I^2=15\%\); \( P<0.001 \)). No increased risk was observed for metformin in those with reduced left ventricular ejection fraction (mortality pooled adjusted risk estimate: 0.91; 0.72–1.14; \( I^2=0\%\); \( P=0.34 \)), nor in those with HF and chronic kidney disease (pooled adjusted risk estimate: 0.81; 0.64–1.02; \( P=0.08 \)). Metformin was associated with a small reduction in all-cause hospitalizations (pooled adjusted risk estimate: 0.93; 0.89–0.98; \( I^2=0\%\); \( P=0.01 \)). Metformin was not associated with increased risk of lactic acidosis.

AlokDhungel, (2006) Conducted This study was designed to compare pulmonary function test between Type II diabetic and non-diabetic individuals; and, with the duration of DM. Material and Methods: This cross sectional comparative study was conducted at King Edward Medical University, Lahore Pakistan. Total sample consist of 91 diabetic and 91 non-diabetic grouped as group A and group B. FEV<sub>1</sub>, FVC, FEV<sub>1</sub>/FVC ratio, and PEFR were compared within two groups and with the duration of DM. Results: Total 182 sample with mean age 53.1±5.90 years, with 91(50%) male and 91(50%) female. Group A and B had 91(50%) sample each. Mean value of FVC, FEV<sub>1</sub> and PEFR showed statistically significant difference among the both group. Mean of FVC decreases significantly with the increasing duration of DM; although, is not significant with FEV<sub>1</sub>, FEV<sub>1</sub>/FVC ratio, and PEFR. Conclusion: Diabetic group showed significantly impaired pulmonary functions test as FEV<sub>1</sub>,

Maliha A. Almarzooq, (2006) Conducted a study on Hypoglycemic effect of momordicacharantia(karela) on normal and alloxan diabetic albino mice. The effects of Bitter Melon (Momordicacharantia) on the normal and onset of alloxaninduced diabetes in male and female Swissalbino mice were examined. It was observed that the mice given orally juice extract of Bitter melon (10 ml/kg BW for 12 weeks) showed a significant decrease in the blood glucose level and glycosylated haemoglobin A1c of diabetic mice induced by intraperitoneal injection of alloxan (50 mg/kg, BW i.p.) and significantly improved the glucose tolerance test. Histological examinations were also done on pancreas. Oral administration of juice extract of Bitter melon (10 ml/kg BW) three times weekly for 12 weeks showed dramatic regeneration in the pancreatic islets of alloxan diabetic mice. The present results suggest that orally given of fruit juice, M.charantiamay have a role in the renewal of β cells in alloxan-diabetic mice or alternately may permit the recovery of partially destroyed β cells. Momordicacharantiamay effectively normalize blood AST, ALT, creatinine and cholesterol in alloxan induced-diabetic group. These findings revealed that juice extract of bitter melon may have a potential benefit in the treatment of diabetes, play a role in its management and reduces the risk of diabetic complications.

Vaishali Gaikwad (2005) conducted a study on Effectiveness of curry leaves on blood sugar level among diabetic clients. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030. The objective of the study was to identify, to assess the blood sugar among diabetes client before and after administration of curry leaves in experimental; and control group and to see and assess the effect of curry leaves on blood sugar. Material and Methods: Quasi-experimental non-equivalent control group design was used. Sample size was 70. Non-probability purposive sampling technique was used. Diabetic clients in the age group above 40 year 3gm of curry leaves powder was administered to the client in experimental group for 30 days. The fasting blood glucose level was monitored on 1st, 15th, 30th day. Result: majority 16 (45.7%) of the clients were from the age group of 51-60 years, majority 22 (62.9%) of the diabetic clients were male, majority 18 (51.4%) of the clients education were secondary and higher secondary level,
majority 27(77.1%) of the diabetic clients were Non Vegetarian, majority 28(80%) of the diabetic clients were from Nuclear family and majority 18(51.4%) of the diabetic clients were having illness for more than 3years. Corresponding p-values were 0.040 and 0.000 at day 15 and day 30 respectively. This indicates that the fasting blood glucose level in experimental group decreased significantly as compared to that in control group. The difference was found statistically significant at <0.05 level, which indicates the effect of curry leaves on blood sugar level.

According to RostamGolmohammadi and BahramiAbdulrabman (2005), the study aimed to identify the relation between occupation stress and the development of Type II diabetes mellitus. We selected 123 employees among 3229 people that diagnosed as Type II diabetes mellitus as subject group and also 150 people, that has normal blood glucose as control group. First questionnaire was used to report characteristics of each subject and second questionnaire has 55 questions about work condition, job environment and personal feeling. This research suggested that occupational stress is related to the development of Type II diabetes mellitus and stress related to interpersonal relationship, physical demands and lack of job interest.

According to EstaChio and Schrier, (2005) the study aimed to identify the association between diabetic complications and exercise capacity in non insulin dependent diabetes mellitus clients. It has been demonstrated previously in Type 2 Diabetes Mellitus clients that several risk factors (i.e., obesity, smoking, hypertension, and African-American race) are associated with an impaired exercise capacity. We studied 265 male and 154 female NIDDM clients who underwent graded exercise testing with expired gas analyses to determine the possible influences of diabetic neuropathy, nephropathy, and retinopathy on exercise capacity. The results were obtained controlling for age, sex, length of diagnosed diabetes, hypertension, race, and BMI. Thus the findings in this large Type II Diabetes Mellitus population without a history of coronary artery disease indicate a potential pathogenic relationship between micro vascular disease and exercise capacity.

According to Morikawa Y (2005) to investigate the relation between occupation and the development of Type II Diabetes Mellitus, we undertook a 10-year follow-up survey of male employees of a zipper and aluminum sash factory in Japan. Of 1,218 employees we followed 1,087 subjects. We classified the subjects into five 25 occupations: managers, technical workers, clerical workers, workers in transport, and laborers. The age-adjusted incidence of the workers in transport was the highest and that
in laborers was the lowest. We used a multiple logistic analysis for adjustment with baseline characteristics such as age, BMI, fasting plasma glucose, and family history of diabetes mellitus. Adjusted relative risk of the workers in transport compared with the laborers was significantly high (3.95). Our work suggests that occupation is related to the development of Type II Diabetes Mellitus.

According to the Sotetsu study (2005), the study aimed to identify the relationship between weight change in your adulthood and the risk of Type II Diabetes Mellitus, the objective is to investigate the independent effect of weight change in young adulthood on the risk of prevalent Type II diabetes mellitus among middle-aged Japanese men, a case-control study was carried out in 895 male employees aged ≥ 30 years of a railway company located in the vicinity of Tokyo. Adjusted odds ratios were calculated for prevalent diabetes in each category of weight change (obtained from subjects’ medical records) in young adulthood and adulthood.

Adjustment for current age, initial BMI, and weight change in each age stratum was performed by the Mantel-Haenszel method or multiple logistic regression analysis, it was identified that the weight change between 20 years of age at maxim weight was not associated with the risk of Type II diabetes mellitus. Weight gain between 20 and 25 years of age was significantly and positively associated with the risk of Type II Diabetes Mellitus.

According to Baba, Kuroda N (2005), the influence of age on diabetic autonomic neuropathy was studied. In the present study autonomic neuropathy was assessed by cardiac beat-to-beat variation during deep breathing (BBV) and pupil area prior to photic stimulus (Al). In the studies on BBV a total of 440 subjects (11-82 26 years in age) were divided into three groups: those with duration of diabetes of less than 5 years and without obvious diabetic complications; those with duration of diabetes of longer than 5 years and with diabetic complications; and non-diabetic, healthy subjects. The relationship between BBV and age was examined in each group.

In the studies on Al a total of 101 subjects (22-75 years in age) were investigated in the same way. The results were as follows: (1) The autonomic nerve function of young diabetics corresponds to that of old non-diabetics in terms of cardiac beat-to-beat variation and pupil area prior to photic stimulus; (2) in young diabetics duration of diabetes and the complications influence the autonomic nerve function; (3) autonomic nerve function is related to age. Age is more influential than duration of diabetes and diabetic complications, especially in the older subjects.