LITERATURE REVIEW:

Alam Khan et al (2003) studied the cinnamon improves blood glucose, triglyceride, total cholesterol, HDL cholesterol, and LDL cholesterol levels in people with type 2 diabetes. This study demonstrates effects of low levels (1–6 g per day) of cinnamon on the reduction of glucose, triglyceride, LDL cholesterol, and total cholesterol levels in subjects with type 2 diabetes.

Atul Sethi et al (2012) developed formulation of sustained release tablets of antiobesity drug Garcinia cambogia. Study shows that formulation of oral sustained release matrix tablet Garcinia cambogia in an attempt to design a dosage form that manifest desirable release profile. The Garcinia fruit is a rich source of hydroxycitric acid (HCA), the active agent that aids in weight loss by inhibiting fat production and suppressing appetite.

Aviva Must et al (1991) showed reference data for obesity 85th and 95th percentiles of body mass index BMI (wt/ht²) and triceps skinfold thickness TSF used operationally to defined obesity and super-obesity. Race specific and population based 85th and 95th percentiles BMI and TSF for people aged 6-74 year were generated from anthropometric data gathered in the National Health and Nutrition Examination survey I (NHANES I). Researcher may choose population based, race specific, and age specific criteria for obesity.

Catherine Ulbricht et al (2010) reviewed an Evidence-based Hypolipidemic Properties of Garlic by the Natural Standard Research Collaboration, all literature collected pertained to efficacy in humans, dosing, precautions, adverse effects, use in pregnancy and lactation, interactions, alteration of laboratory assays, and mechanism of action, discussing the application of garlic for the mitigation of hyperlipidemia. Evaluation of the literature has revealed a number of controlled trials examining the effects of oral garlic on serum lipids.

de la Garza AL et al studied natural inhibitors of Pancreatic Lipase as new players in obesity treatment. The study shows that the pharmaceutical industry has invested
many efforts in producing antiobesity drugs; but only a lipid digestion inhibitor obtained from an actinobacterium is currently approved and authorized in Europe for obesity treatment. This compound inhibits the activity of pancreatic lipase, which is one of the enzymes involved in fat digestion. In the same way hundreds of extracts are currently being isolated from plants, fungi, algae or bacteria and screened for their potential inhibition of pancreatic lipase activity. Among extracts isolated from common foodstuffs such as tea, soybean, ginseng, yerba mate, peanut, apple or grapevine have been reported inhibition of pancreatic lipase activity.

Dhanapakiam P. et al (2008) studied administration of coriander seeds on the metabolism of lipids in rats, fed with high fat diet and added cholesterol. The coriander seeds had a significant hypolipidemic action. According to the study level of total cholesterol and triglycerides increased significantly in experimental group. The study shows significant increase in b-hydroxy, b-methyl glutaryl CoA reductase and plasma lecithin cholesterol acyl transferase activity were noted in the experimental group. Low density lipoprotein (LDL) and very low density lipoprotein (VLDL) cholesterol level decreased while that of high density lipoprotein (HDL) cholesterol increased in the experimental group.

El-Sayed M. ElRokh and Nemat A. Z. Yassin (2010) studied the effect of aqueous ginger infusion (Z. officinale) as an antihypercholesterolaemic agent in adult albino rats (in vivo), where the dose of 200 mg/kg of ginger is equivalent in the efficacy to that of atorvastatin while the dose 400 mg/kg of ginger is more effective as hypocholesterolaemic agent than atorvastatin when given for the same duration of time under the same conditions of diet and life style for the treatment of the same pathologic condition.

Frank Isken et al (2010) studied effects of long-term soluble vs. insoluble dietary fiber intake on high-fat diet-induced obesity in C57BL/6J mice. Study shows that long-term supplementation of a high-fat Western-style diet with soluble highly fermentable guar fiber resulted in an obese phenotype in C57BL/6J mice. In contrast, supplementing the same diet with moderately fermentable insoluble cereal fiber prevented a high-fat diet-induced obese phenotype in these animals.
Gurpreet Kaur and S.K. Kulkarni (2000) studied the antiobesity effect of Polyherbal formulation OB-200G, in female Wistar rats fed on cafeteria and atherogenic diets. In this study Female rats were fed cafeteria diet includes a variety of human snack foods and atherogenic diet for 40 days. OB-200G was administered in a dose of 400 mg/kg, p.o., twice a day to the drug treatment groups. There was a significant (p < 0.05) reduction in body weight, also significantly (p < 0.05) decreased total cholesterol in rats fed with atherogenic diet.

Hemshekhar M. et al (2011) reviewed on genus garcinia: phytochemical and therapeutical aspects. Literature revealed that genus Garcinia includes more than 300 species and found to be rich source for many pharmacologically and medicinally important chemicals entities, such as hydroxycitric acid, garcinol, isogarcinol, xanthochymol, iso xanthochymol, cyclo xanthochymol, xanthone and its derivatives, bioflavanoids, terpenes, procyanidines and isoforms of guttiferone. The isolated compounds have also been widely studied for their various therapeutic and pharmacological activities like anti-oxidant, anti-inflammatory, anti-bacterial, anti-viral, anti-protozoan, anti-ulcer, anti-cancer and hypolipidemic properties.

Jay Udani et al (2004) studied a Clinical Trial Using Phase 2™, water-extract of a common white bean (Phaseolus vulgaris) that has been shown in vitro to inhibit the digestive enzyme alphaamylase. Inhibiting this enzyme may prevent the digestion of complex carbohydrates, thus decreasing the number of carbohydrate calories absorbed and potentially promoting weight loss. In this study Fifty obese adults were screened to participate in a randomized, double-blind, placebo-controlled study evaluating the effects of treatment with Phase 2 versus placebo on weight loss.

Jong Won Yun (2010) reviewed the scientific data, including experimental methodologies, active components, and mechanisms of action against obesity. Study shows that different obesity-treatment drugs are currently available in market like orlistat, which reduces intestinal fat absorption via inhibiting pancreatic lipase; and sibutramine, an anorectic or appetite suppressant. Both drugs have lots of side-effects, including increased blood pressure, dry mouth, constipation, headache, and insomnia. For this reason, a wide variety of natural materials have been explored for their obesity treatment potential.
Lee M. Kaplan (2005) reported Pharmacological Therapies for Obesity, recent studies of the physiology of body weight regulation have demonstrated the complexity of this control system and have identified numerous novel targets for therapeutic intervention. These studies provide new, more specific agents will provide more effective and durable treatment of obesity with fewer adverse effects. Thus, long-term effective treatment is likely to require a multi-modal approach, using multiple drugs aimed at different targets or novel combinations of specific pharmacological, nutritional, endoscopic, and surgical approaches.

Lorraine Sakhi Zack reported the basic principles of Ayurveda and how to rebalance ayurvedic doshas, there are three types of doshas, called Vata, Pitta and Kapha, and each is mainly a combination of two elements. Vata dosha is made up of space and air. Pitta dosha is a combination of fire and water. Kapha dosha is made up of water and earth. For good health and well-being to be maintained balance all three doshas.

Mahtab Z. Siddiqui (2011) reported Guggul is an excellent herbal panacea, its use wide variety of diseased conditions, including atherosclerosis, hypercholesterolemia, rheumatism, obesity respiratory disease, liver disorder digestive problem and menstrual irregulation. Study shows that guggul significantly lovers serum triglyceride and cholesterol as well as low density lipoprotein (LDL or β lipoproteins) i.e bad cholesterol. It elevates the beneficial high density lipoprotein (HDL or α lipoproteins) i.e good cholesterol.

Mohamed Fawzy Ramadan et al (2008) studied Coriander (Coriandrum sativum L.) seed oil improves plasma lipid profile in rats fed a diet containing cholesterol. Study shows that effect of administration of coriander seed oil and oil blend [a mixture of soybean oil, coriander oil and sunflower oil (4:2:4, w/w/w; Blend)] on the profile of plasma lipids in 24 male albino rats. Plasma total lipids (TL), triacylglycerols (TAG), total cholesterol (TC), low-density lipoprotein-cholesterol (LDL-C) and high-density lipoprotein-cholesterol (HDL-C) were measured at day 15, 30, 45 and 60 during the experiment period. Coriander seed oil and Blend-supplemented diets decreased the levels of TL, TC, TAG and LDL-C in plasma and significant increase in the levels of HDL-C.
Nandini Venkatesan et al (2006) studied a fibre cocktail of fenugreek, guar gum and wheat bran reduces oxidative modification of LDL induced by an atherogenic diet in rats. This study was undertaken to evaluate the influence of a novel fibre mix of fenugreek seed powder, guar gum and wheat bran (Fibernat) on LDL oxidation induced by an atherogenic diet. Male Wistar albino rats were used in this study. Peroxidative changes in low-density lipoprotein (LDL) and the oxidative susceptibility of LDL and the LDL + VLDL (very low-density lipoprotein) fraction were determined.

Nitesh Sood et al (2008) studied the systematic review and meta-analysis on effect of glucomannan on plasma lipid and glucose concentrations, body weight, and blood pressure. Glucomannan is a soluble fiber derived from Amorphophallus konjac. Glucomannan is thought to prolong gastric emptying time, which increases satiety, reduces body weight, decreases the ingestion of foods that increase cholesterol and glucose concentrations, reduces the postprandial rise in plasma glucose, suppresses hepatic cholesterol synthesis, and increases the fecal elimination of cholesterol containing bile acids.

Patil Manoj N et al (2010) studied effect of Polyherbal formulation in obesity associated diabetes, study shows that many herbs having both antidiabetic as well as antiobesity activity, polyherbal formulation for obesity associated diabetes containing Gymnema sylvestre R., Garcinia cambogia, Lagerstromia speciosa L., was investigated in normal and obese streptozotocin induced diabetic rats. Oral administration of the formulation for 21 days significantly decreased serum glucose, total cholesterol, triglycerides, LDL, VLDL levels and body weight and increased the HDL level.

Philomena George and Prabhuprasad Paduchuri (2011) reviewed on antiobesity properties of some medicinal plants. The antiobesity properties of medicinal plants are exhibited by different mechanisms. There are different studies for exactly knowing the cause of animal obesity. This review will try to focus and summarize on the main findings available in the literature regarding the effect of different medicinal plants and their extracts on human obesity.
Ramesh B. and Saralakumari D. (2012) studied the effect of ethanol extract of Commiphora mukul gum resin (CMEE) on blood glucose, plasma insulin, lipid profiles, reduced glutathione, lipid peroxidation, protein oxidation and enzymatic antioxidants like superoxide dismutase, catalase, glutathione reductase, glutathione peroxidase, glutathione-Transferase in fructose-induced type-2 diabetic rats. The study shows that Insulin resistance and hyperinsulinemia have been correlated with hypertension, dyslipidemia, glucose intolerance and obesity, as well as with cardiac hypertrophy and atherosclerotic cardiovascular disease.

Ramesh Chander et al (1996) studied lipid lowering activity of guggulsterone from Commiphora mukul in hyperlipaemic rats. The study of active constituent of guggulipid done on triton and cholesterol fed hyperlipaemic rats. Serum lipids were found to be lowered by guggulsterone (50 mgkg, b.w.) in triton WR-1339 induced hyperlipaemia. This study shows that guggulsterone activates lipolytic enzymes in plasma and liver as well as stimulated receptor mediated catabolism of low density lipoprotein. The hypolipidaemic activity of this drug is due to inhibition of hepatic cholesterol biosynthesis, increased faecal bile acid excretion and enhanced plasma Lecithin cholesterol acyltransferase activity.

Seori Jin and Kyung-Hyun Cho (2011) studied water extracts of cinnamon and clove exhibits potent inhibition of protein glycation and anti-atherosclerotic activity in vitro and in vivo hypolipidemic activity in zebrafish. In this study aqueous extracts of ground pepper, cinnamon, rosemary, ginger, and clove were analyzed and tested for antiatherosclerotic activity in vitro and in vivo using hypercholesterolemic zebrafish. Study shows that Cinnamon and clove had the strongest inhibition of activity against copper-mediated low-density lipoprotein (LDL) oxidation and LDL phagocytosis by macrophages. Cinnamon or clove extracts had potent cholesteryl ester transfer protein (CETP) inhibitory activity. Cinnamon and clove exhibit hypolipidemic activity in a hypercholesterolemic zebrafish model.

Shirin Hasani-Ranjbar et al (2009) reviewed on a systematic review of the efficacy and safety of herbal medicines used in the treatment of obesity. Studies with Cissus quadrangularis (CQ), Sambucus nigra, Asparagus officinalis, Garcinia atroviridis, ephedra and caffeine, Slimax (extract of several plants including Zingiber officinale and Bofutsushosan) showed a significant decrease in body weight. In 41 animal
studies, significant weight loss or inhibition of weight gain was found. Compounds containing ephedra, CQ, ginseng, bitter melon, and zingiber were found to be effective in the management of obesity.

**Singh et al V. (1990)** studied stimulation of low density lipoprotein receptor activity in liver membrane of guggulsterone treated rats. Chronic feeding of guggulsterone to rats showed hypolipidaemic activity in blood serum and liver membrane lipids. The decrease in serum cholesterol is associated with enhanced uptake of LDL by the liver through receptor mediated endocytosis, located on the surface of the cell membrane. The study has been shown that membranes prepared from liver of guggulsterone treated rats exhibit up to 87% increase in binding sites for human 1251-LDL. Significant decrease in lipid levels of serum as well as of membrane were observed.

**Young Sook Kim et al (2010)** determined anti-obesity effect of Morus bombycis root extract: Anti-lipase activity and lipolytic effect. Lipase (triacylglycerol acylhydrolase, EC 3.1.1.3) activity was determined by measuring the hydrolysis of p-nitrophenyl butyrate to p-nitrophenol at 405 nm. Lipolytic effects were assayed in fully differentiated 3T3-L1 adipocytes and adipose tissues.