EFFECTS OF SUNFLOWER (HELIANTHUS ANNUUS) SEED EXTRACTION ON WEIGHT, BODY COMPOSITION, AND FASTING BLOOD GLUCOSE IN INDIVIDUALS WITH TYPE 2 DIABETES IN BAGHDAD CITY

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Abstract
The goal of the current study is to measure and evaluate the effectiveness of sunflower seeds in lowering type 2 diabetic patients' "FBS" Fasting Blood Glucose levels. In this study, 60 patients—24 women and 36 men—were separated into the case and control groups. Chlorogenic acids 40% at "500 mg/day" of treatment for "3 months" on various measurements of "Height, Weight, and Blood pressure" as well as biochemical measurements of "Cholesteatoma, Tri -glyceride, Low-Density-Lipoprotein [LDL], High-Density-Lipoproteins [HDL], as well as Fasting-Blood-sugar [FBS]" in those people who were on record at The body weight and Body Mass Index of those who consumed sunflower seed extract decreased positively and quickly (BMI). Blood glucose levels dropped from 197.4 mg per deciliter to 120 mg per deciliter in the patient group while decreasing from 175.5 mg per deciliter to 130.9 mg per deciliter in the control group as a result of lower blood cholesterol levels. It is determined that sunflower extraction aids in egulating "body weight; fat mass; and lipid profile" and that it can be used as a natural remedy for diabetics to reduce their blood sugar levels. By raising HDL levels, it also helps to maintain heart health.

Keywords: Sunflower seeds, Diabetes Mellitus type 2, weight loss, lowered BMI, fasting blood glucose, and cholesterol

Introduction
Helianthus-annuus, a courtly plant with its origins in North America, has spread throughout the world because to its ability to produce seeds with a 30 to 40 % oil content, ranking it as the fourth-most oil-rich crop in the world [1]. The seeds of Helianthus annuus are very

"protein-based, vitamin-rich, mineral-rich, and anti-oxidant-rich." In particular, phenolic chemicals and chlorogenic acid make up 1–5% of the total mass of the sunflower oil extract (CGAs) [2,3]. Similar to other seeds, sunflower seeds are rich in proteins and contain large amounts of the amino acid "tryptophan," which is crucial for growth, particularly in youngsters, according to research by [4]. It is a wealthy source of "niacin; folicacid; Bcomplex-vitamins(B1-B2) and pantothenic-acid, as well as Iron, Zinc; Manganese, Copper, Selenium and Calcium," which played a significant role on "productivity of hormone; enzymes-synthetic; production of RBC; bones-mineralizing; metabolic regulator; activities in cardio or skeleton muscles" [5]. According to WHO (1996), 15 percent of individuals worldwide had a BMI of 35 or higher, whereas 45% of people worldwide had a BMI of 30 to 35. Diabetes, hypertension, heart disease, rheumatoid arthritis, and many cancers are all highly correlated with obesity[6]. According to the WHO, the prevalence of obesity was "40 percent," diabetes was "25 percent," heart disease was "9 percent," and cancer was "43 percent" [7]. Diabetes mellitus type-2, which is more frequently characterized as (hyperglycemic) in case the insulin-resistant, occurs primarily as metabolism disordering. Additionally, [8] revealed that type-1 diabetics have a complete poverty levels in insulin as a collapse in "-cell at langerhans islets at pancreas organ". The general symptoms may include "severe famine, frequent nighttime urination, frequent urination, and extreme drought." More than 95% of diabetics have type 2 diabetes, compared to 5% who have type 1 diabetes and occasionally have diabetes during pregnancy. The prevalence of type-2 diabetes is higher among those who are obese, especially those who already have a genetic predisposition to the metabolic disorderliness noted by [9] Approximately 286 million people had diabetes as of 2010, up from 32 million in 1985. Long-term complications of "Hyper-glycemia" include "stroking," diabetes-retinopath, diabetes-nephropath, "proceeding renal dysfunction then lead to need dialyses," and cardio disease. Little blood flow at the limb also results in mutilation. "Ketoacidoses" is the name given to those severe complications; (the most prevalence in Diabetic type1). [10].

Materials and Methods

In this study, samples of 60 cases, aged between 32 and 56 years old and separated into the control and patient groups, including 36 men and 28 women (10 person at each group). A BMI of 35 to 45 kg/m2. In contrast to the control group, which received merely diet advice, the patient group began taking two capsules per day, one before breakfast and the other before lunch, after three months. Each pill contains 250 mg (sunflower-extract). All data were collected prior to supplementation for both the control group and the patients using full assistance for diet surveys, vital signs (biochemical tests including dietary history, diabetes history, high-chart, and BMI/FBS), and also following supplementation using various biochemical parameters that were tested at the end of each month. The data were then statistically analyzed using SPSS and the t-test. Vacuum anticoagulant tubes have been used to collect blood samples for the purpose of extracting serum. then and kept at the refrigerator

while being subjected to analysis. Glucoses (mg/dL), hemoglobin Hb (percent), cholesterols (mg/dL), HDL (mg/dL), LDL (mg/dL), triglycerides (mg/dL), and free fatty acids (nmol/dL) are among the safety analyticals that FBS collect throughout the visitation.

Results

The age range of the 60 cases (36 males and 24 females) in the current study samples for both the control group and the patient group was between 32 and 56 years old (10 person at each group). the BMI, which ranges from 35 to 45 kg/m2. Our research revealed that taking 500 mg of a 40 percent chlorogenic acid sunflower extract daily for three months significantly decreased body weight, BMI, and other fatty related measurements.

Table 1: group readings with the patients

Patients group	Fasting blood sugar		Cholesterol		Triglycerides		High density lipoprotein		Low density lipoprotein	
Before/After	**B.**	**A.**	**B.**	**A.**	**B.**	**A.**	**B.**	**A.**	**B.**	**A.**
Mean	197.4	120	156.9	144	131	124.2	34	46	93	95
S.D.	37.28	9.29	27.76	17.30	28.19	19.43	9.30	12.63	18.86	17.89
p- value	0.00*		0.001*		0.001*		0.015*		0.934**	
Sign./non.sign.	Sign.		Sign.		Sign.		Sign.		Non sign.	

Table 2: readings from the control group

Control group	Fasting blood sugar		Cholesterol		Triglycerides		High density lipoproten		Low density lipoprotein	
Before/After	**B.**	**A.**	**B.**	**A.**	**B.**	**A.**	**B.**	**A.**	**B.**	**A.**
Mean	175.5	130.9	173.2	159	129	125	39	43	110	116
S.D.	32.86	8.20	22.32	15.11	12.79	10.16	5.52	1.02	13.93	10.18
p- value	0.00*		0.001*		0.002*		0.00*		0.162**	
Sig./non.sig.	Sign.		Sign.		Sign.		Sign.		Non sign.	

S.D.: standard Deviation ;*Sign. : significant ; **non sign.: non-significant

Table 1 of the patient group shows that the fasting blood sugar (FBS) p-value was 0.00, which is less than 0.05, indicating a significant relationship. While the p-value for the cholesterol (Chol.) and triglycerides was 0.001, it is now <0.05, making it likewise significant. The p-value for HDL is 0.015, which is less than 0.05 and increases the value significantly. While at LDL, the relationship is not significant (p value = 0.934, >0.05).

At fasting blood sugar (FBS) in the control group at table 2, the p-value was 0.00, which is less than 0.05, indicating a significant relationship. In contrast, the p-values for the cholesterol (Chol.) and triglycerides were 0.001, 0.002, respectively, making them also significant values. The p-value for HDL is 0.00, which is less than 0.05, making the value significant. While at LDL, the relationship is not significant (p value = 0.162 >0.05).

The graphs reveal a significant reduction in FBS grade in the patient group receiving sunflower extract as compared to the control group (175.5 mg/dl into 130.9 mg/dl). Group of cases (197.4 mg/dl to 120 mg/dl) Figure-1.

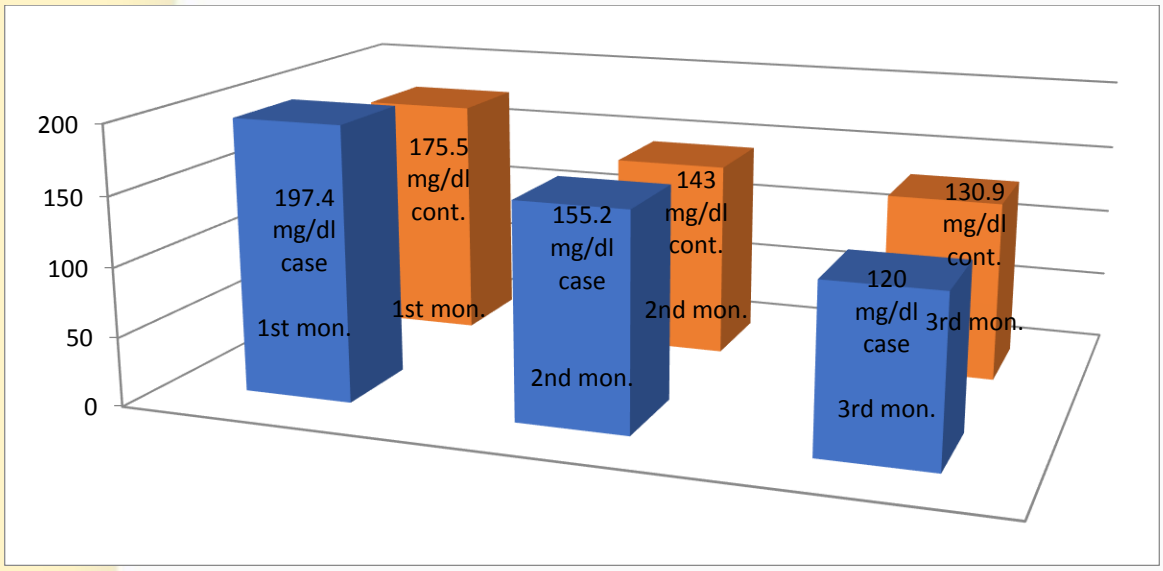

Figure 1: Comparative analysis between the patients and controls group reveals typical FBS/monthly visitation values.

As indicated in Figure 2, cholesterol levels rise in the case group (156.9 mg/dl to 144 mg/dl) and the controlled group (173.2 mg/dl to 159 mg/dl).

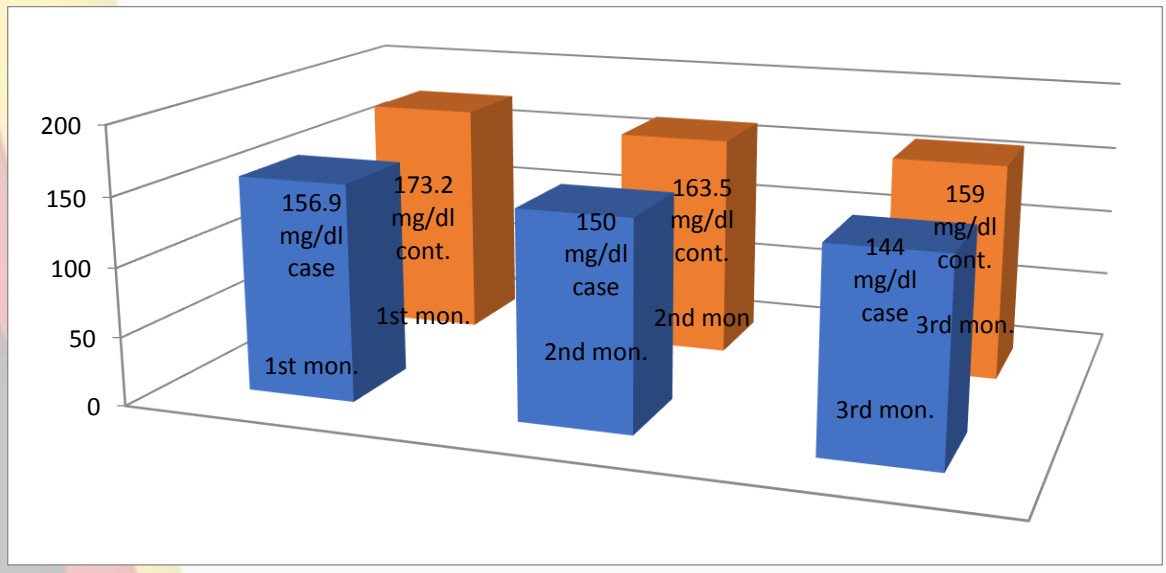

Figure2: Study comparing cases and controls with average levels of cholesterol every visit.

The triglycerides indicate a positive and significant decrease compared to control, as illustrated in figure 3. Case group (131 mg/dl into 124.2 mg/dl) was higher than the Control group (129 mg/dl into 125 mg/dl).

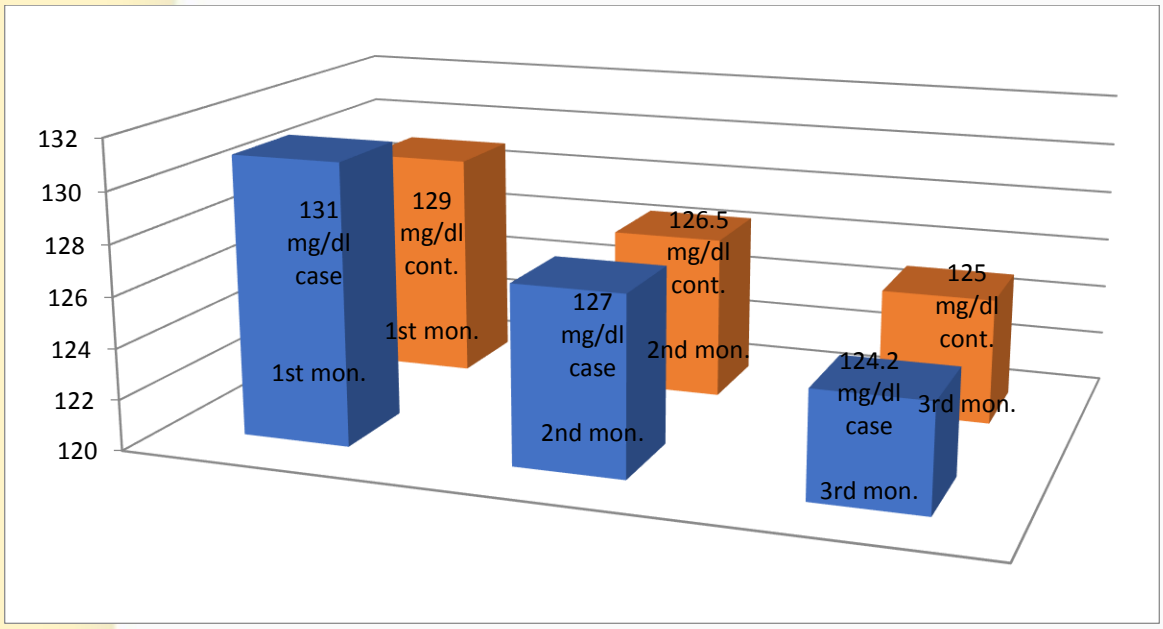

Figure 3: A comparison between Case and Control reveals an average quantity of Triglyceride every visit.

In figure 4 (HDL), the controlling group (39 mg/dl into 43mg/dl) shows a significant increase while the patient group (34 mg/dl to 46mg/dl) shows a significant decrease.

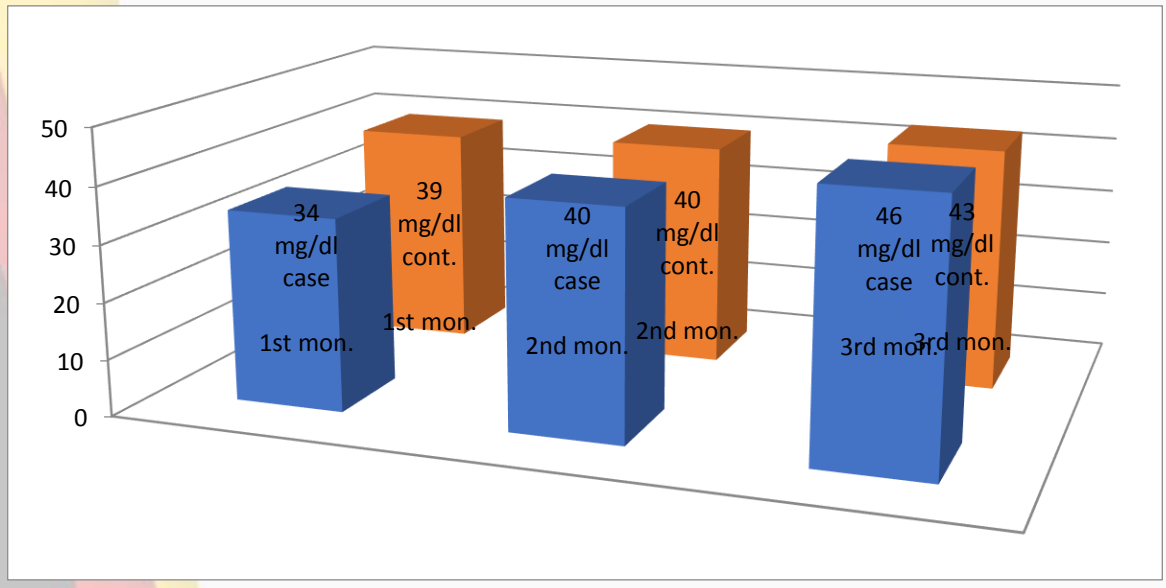

Figure 4: The mean of HDL values each visit is shown in a comparison between patients and the control group.

While the LDL cholesterol in figure (5) shows a decline from the patients' group to the controlled group (110 mg/dl to 116 mg/dl), the patients' group (93 mg/dl to 95 mg/dl) seems not to.

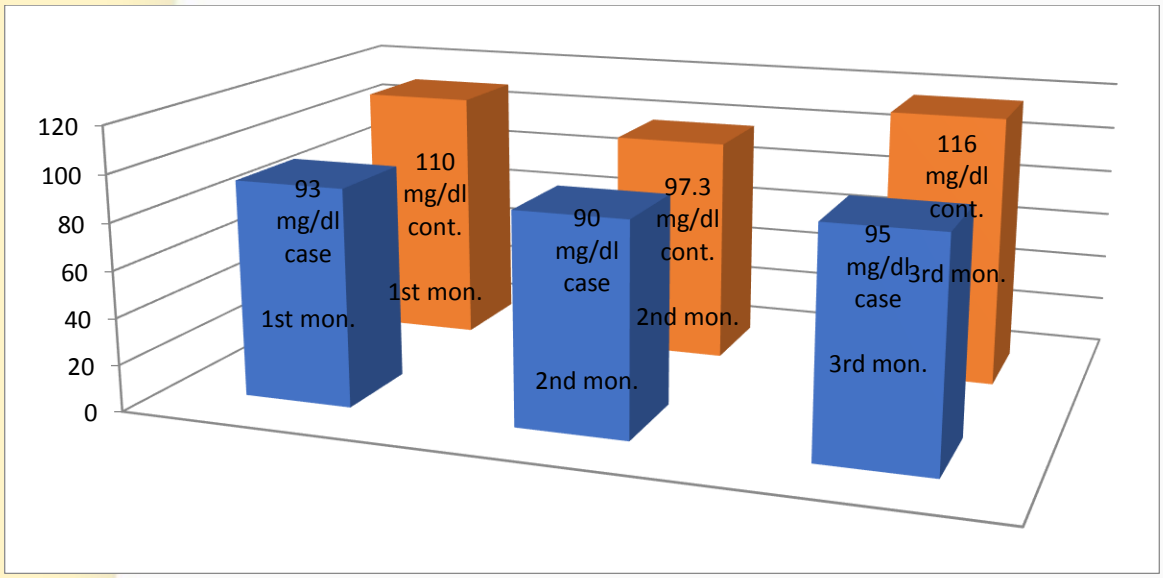

Figure 5: The average LDL amount/visit is shown by comparing the patients' group toward the control group.

Discussion

The active components of sunflower extract have been previously investigated for their potential to combat obesity and to reduce the risk of diabetes and various cardiac illnesses according to the findings of [11]. The extraction may control adipogenesis during the interaction with PPAR, regulate lipid metabolism, and regulate energy equations among AMPK pathway. It may also specifically target the weight seep immovables of sunflower seeds extraction to produce CGAs, which have a dose-dependent action as suggested by previous animal studies and numerous clinical trials. sunflower seed extract can lower blood levels of triglycerides, LDL cholesterol, and other lipids according to [12,14] reported the decrease in serum of cholesterols further to the LDL of (hyper-cholesterolemic-rate) after treat with 10/mg CGA per kg in 1 month "equals 1.6 mg per kg on individual." Some animal studies have been recorded the dosage depending advance for lipid-profile comes next to exhaustion in CGAs shown by [13] who demonstrated a significant decrease in serum total cholesterol (TG) levels in mice fed with 400 mg/kg of "green coffee beans extracted" (standardized to include 108 mg/kg of CGAs). This may be equivalent to the 8.5mg CGAs per kg of an individual that were detected during treatment for a 90kg of 1800mg sunflower extraction. It is in line with the current findings and suggests that high doses of sunflower extraction can have a positive impact on a lipid-profile. According to an adjustment made after three visits, using sunflower extract can help to reduce cholesterol levels. It has been claimed that long-term treatment may result in a significant decline in blood parameters like cholesterol, TG, and LDL. In light of the importance of triglycerides as a risk factor for heart disease as described by [15] and the atherogenes characteristics on hyperlipidemia including highly

standard cholesterols, [16,18]. Half a spatula from the seedling each day may provide the ideal levels of "protein, vitamin-rich, mineral-rich, and antioxidants," whereby sunflower seeds have a significant role in reducing the values of fasting blood sugar in diabetic type 2 patients. According to [17] chlorogenic acid, which is abundant in sunflower seeds as we previously mentioned, aids in the control of blood sugar in diabetic patients. Sunflower seeds provide 3 grams of fiber and 5 grams of protein per ounce, making up the "kernel a portion of another weal." The minimal value can be included in meals by adding it to salads, topping off bread or vegetable mixtures, and oat and cereal can also be found in nutritious snacks. This may aid the body in maintaining the heart health that [5] have seen by regulating blood sugar levels and HDL levels in the blood.

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