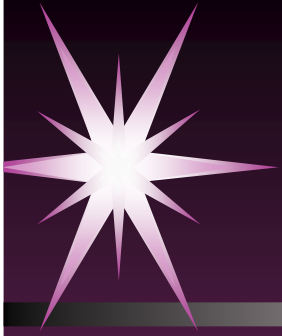# The effect of restricted diet with olive oil versus fish oil combined with endurance exercise on Dyslipidemic females
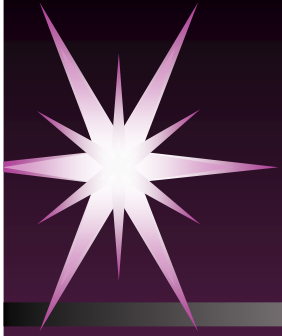
Prof. Dr. Samy A. Nassif PhD, PT

Dean of Faculty of Physical Therapy - PUA
Professor of Physical Therapy,
Department of Basic Science,
Faculty of Physical Therapy,
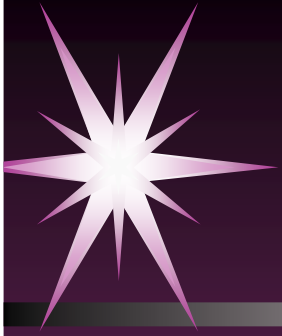**Cairo University**

Dyslipidemia is abnormal levels of lipids (total cholesterol (TC), TG or both) carried by lipoproteins in the blood.

↗ This term includes hyperlipoproteinemia (hyperlipidemia) which refers to abnormal high levels of TC, LDL-C , and TG, as well. (Goldberg, 2008).
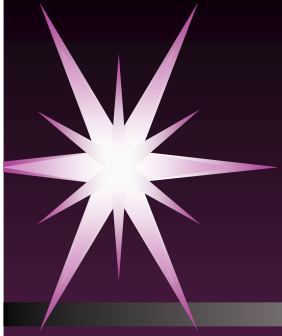
It was suggested that TC level is only a general guide to the risk of atherosclerosis.
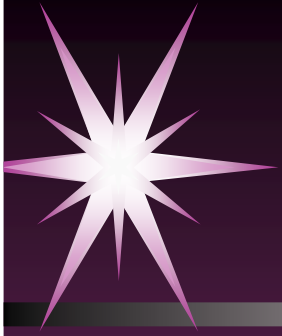
↗ Levels of the components of TC particularly LDL-C and HDL-C are more important.

↗ A high level of LDL-C increases the risk. A high level of HDL-C decreases the risk. (Goldberg, 2008).
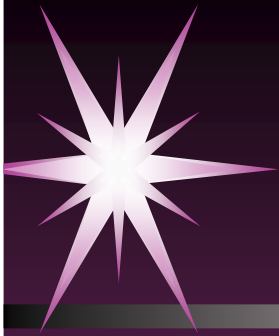
At present, dyslipidemia is most commonly treated with lipid-altering pharmacological therapies. However, safety concerns regarding the use of these agents have prompted the need for safe and efficacious non pharmacological lipid-altering interventions..
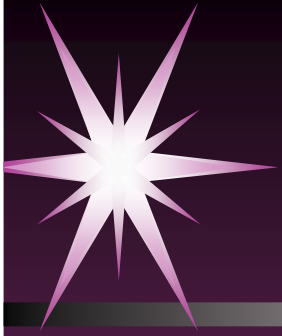
↗ **Life style interventions, in the form of dietary modification and exercise, are effective means of managing and treating high serum levels of TC and TG in individuals diagnosed with dyslipidemia.**
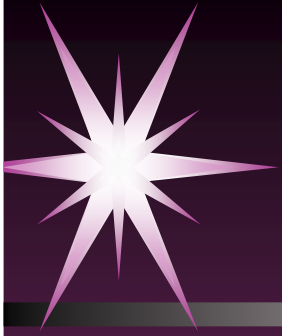
↗ **Such interventions should always be attempted as the initial step in the management and treatment of lipid abnormalities, especially when TC levels, LDL-C levels, or TG serum levels are just above the reference range. (Berg et al., 2003).**
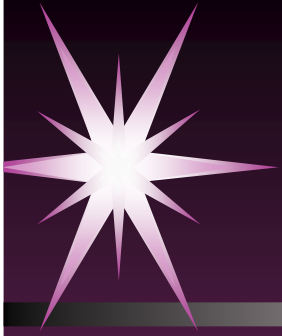
↗ **Various studies have shown HDL-C levels increase by 4-43% with exercise; A reduction in TG levels also occurs 18-24 hours after an acute bout of exercise and can persist for up to 72 hours. (Thompson et al., 2001).**
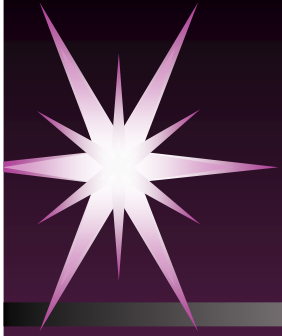
⬈ **Prolonged exercise generally induces a small reduction in LDL-C levels. Such decrease was shown to be around 8%.The addition of a weight-reducing; low-fat diet to exercise significantly enhances the LDL-lowering effect. (MacKnight, 2003).**
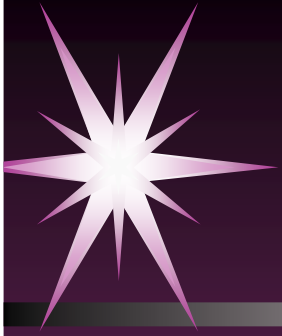
↗ **Epidemiological and biochemical studies indicate that the Mediterranean diet, in which olive oil is the major source of fat, reduces the risk of coronary heart disease and cancer**
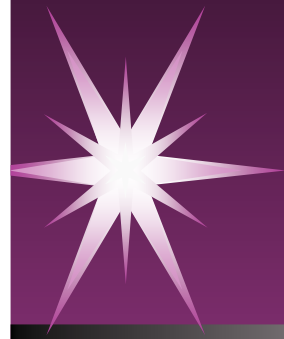
↗ **It has been proposed that the beneficial effects of olive oil not only depend on oleic acid but also associated with polyphenolic components of olive oil. (Akhlaq . Farooqui, 2009).**

↗ **Dunstan** **et al, 2010 examined the effects of moderate aerobic exercise and the incorporation of fish oil into a low-fat (30% total energy) diet on serum lipids in dyslipidemic patients**

↗ **In the current study, the effect of restricted calorie diet containing olive oil versus restricted calorie diet containing fish oil combined with endurance training exercise on blood lipid profile in obese females had been investigated**

Materials & Methods

Design of study

↗ This study was controlled randomized study that was conducted to determine the best type of diet to improve the lipid profile in obese females.

Subjects

↗ Sixty obese young females with age Ranged between 20-40 years were selected for this study.

↗ BMI were ranged from 30 -34.99 kg/m2 according to WHO's classification (2010).

↗ The sixty subjects were divided randomly into three groups each group consists of twenty subjects.

Randomization

↗ Randomization was achieved using one to one randomization method by allocating patients according to their arrival to the clinic, one to each of the three groups, one by one.

group A	• received restricted calorie diet (1200 cal/day daily) containing olive oil (40 ml/day three times a week) and a program of endurance training exercise (moderate intensity 3 times/week)
group B	• received restricted calorie diet (1200 cal/day daily) containing fish oil (in form of 204 gram mackerel fish to supply the patient with 3.6 gram omega-3 / day three times a week) and a program of endurance training exercise (moderate intensity 3 times/week)
group C	• received restricted calorie diet (1200 cal/day daily) and a program of endurance training exercise only. (Moderate intensity 3 times/week)

Evaluating instrumentation and materials :

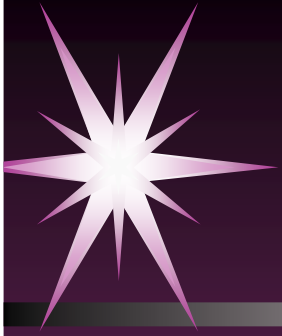↗ Weight & height scale: (Healthy scale 200 kg) to evaluate the height, weight to calculate BMI.

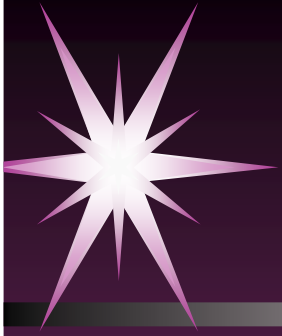# Blood lipid analyzer (Roche Hitachi 912 Chemistry Analyzer)

mistry Analyzer

↗ The Roche Hitachi 912 Chemistry Analyzer is a fully automated, discrete, computerized chemistry analyzer offering reliability, quality and convenience.

↗ The Roche Hitachi 912 Chemistry Analyzer is an extremely flexible system for the performance of both standard and special clinical chemistries (e.g. blood lipid test).
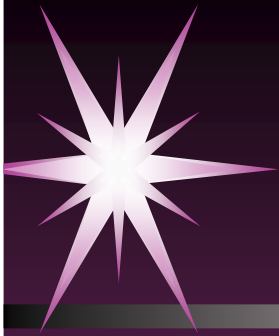
treatment instrumentation and materials :

↗ Restricted calorie diet models (1200 cal/day) including whole grains (bread, cereals& pastes), fruit , fruit juices, vegetables, vegetable oils, low-fat dairy and meat products according to my pyramid ,2005

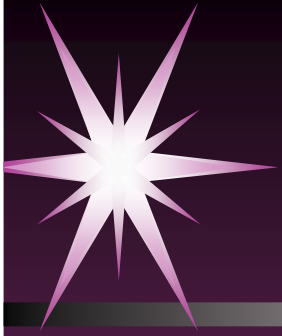|	Protein	Fat	Carbohydrate
Calories	15%	30%	55%

⬈ After 12 weeks, the blood samples had been taken again and plasma lipid profile was measured and then the pre and post samples for the two groups were compared. Also, comparison between the three groups had been done.
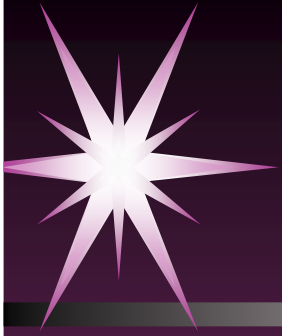
Designing nutritional plan for each subject (1200 cal /day) daily, the nutritional plan was contain balanced diet (contain all food groups) (according to USDA guidelines 2005)(my pyramide 2005)
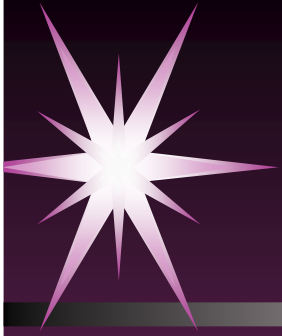
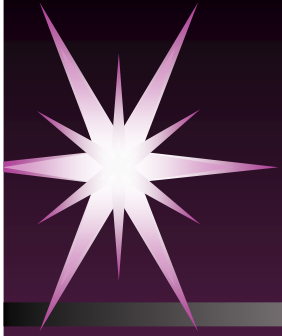| Energy prescription	Starchy foods	vegetables	Fruit	meat/fish	fat	milk	Kilo calories	Allowance For extra
1200	5 serving	3 serving	3 serving	4 serving	3 serving	1.5 serving	1090	50 kcal

- Adding (40.5 gram/day) version olive oil three times a week to the nutritional plan of Group A
- 40 .5ml = 3 tbsp
- 1 tbsp = 13.5 gram
- 1 tbsp =119 kcal
- According to olive composition mentioned before **(Lorie samoline and mary ,2007).**
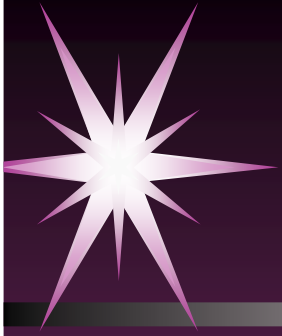- So there was 357 kcal were added to (group A) diet.

- Adding 204 gram pacific mackerel fish (grilled) to supply subjects with 3.6 gram omega-3 / day three times a week to the nutritional plan of (Group B)

- 85 gram mackerel fish gives 184 kcal.

- 204 gram mackerel fish gives 441.6 kcal.

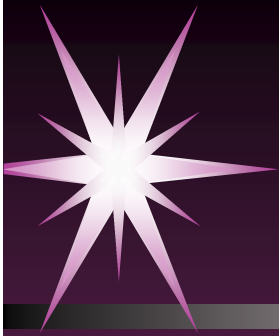- So there was 441.6 kcal were added to (group B) diet.

↗ Group C did not receive any adding food on the essential restricted calorie diet (1200 kcal).

- All females who participated in the study attend a program of Endurance training with moderate intensity 3 times/week .
- Endurance training was performed with the use of stationary bicycles.

↗ Exercise duration was 30 min without rest in the first week (1-3 session), 45 min without rest in the second week (4-6 session) and 60 min without rest from the third week to the end of the program (7-36 session). **(Krista et al.,2004).**
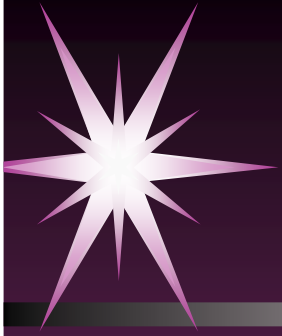
↗ Compliance was assessed by recording the subject's attendance at each session. If a training session was missed, the subject was required to make up for the missed session during the same week.
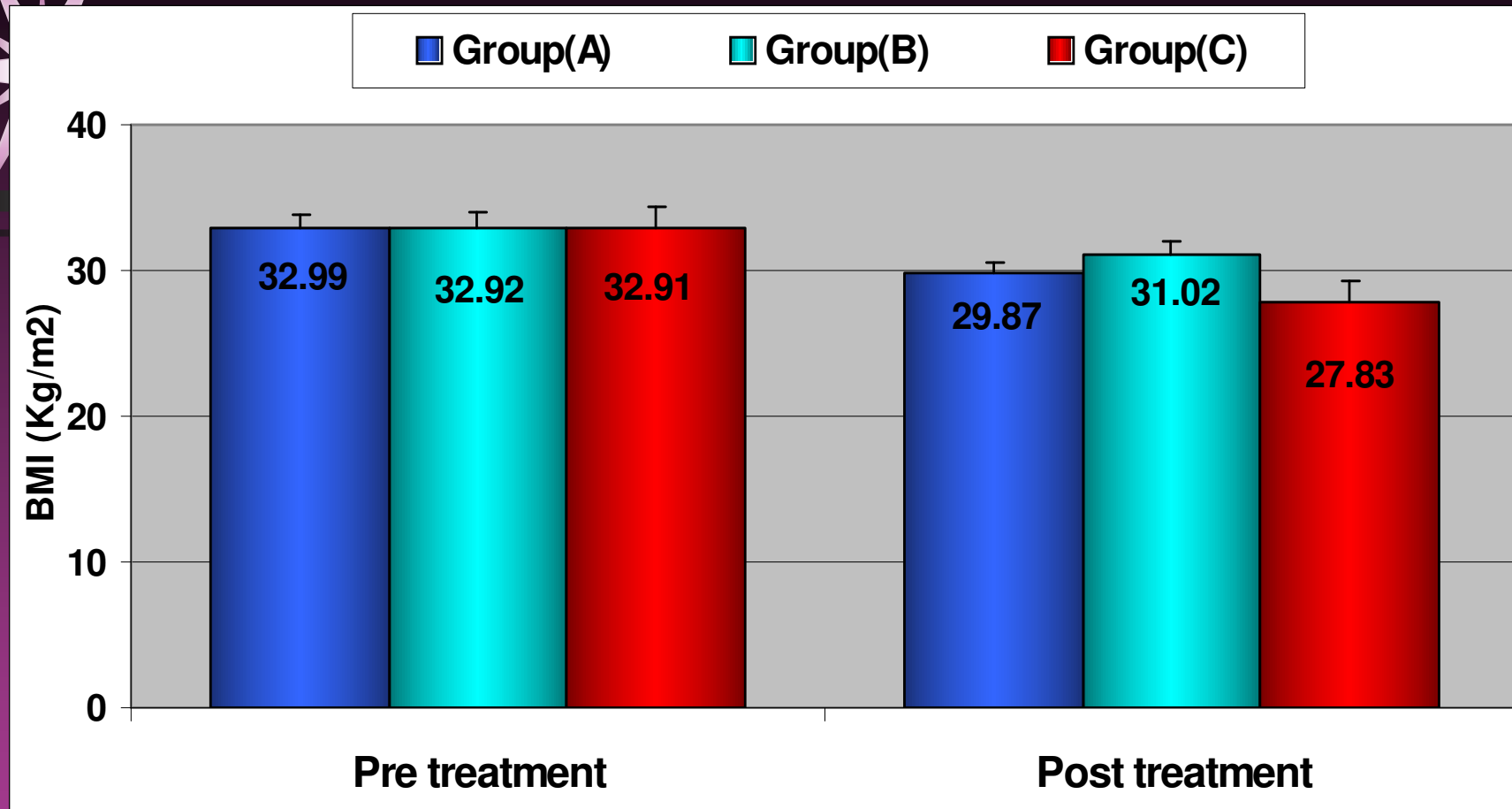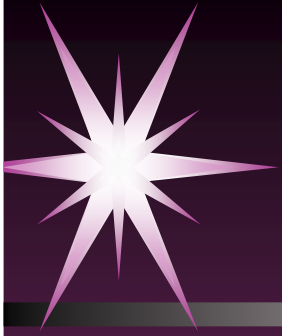

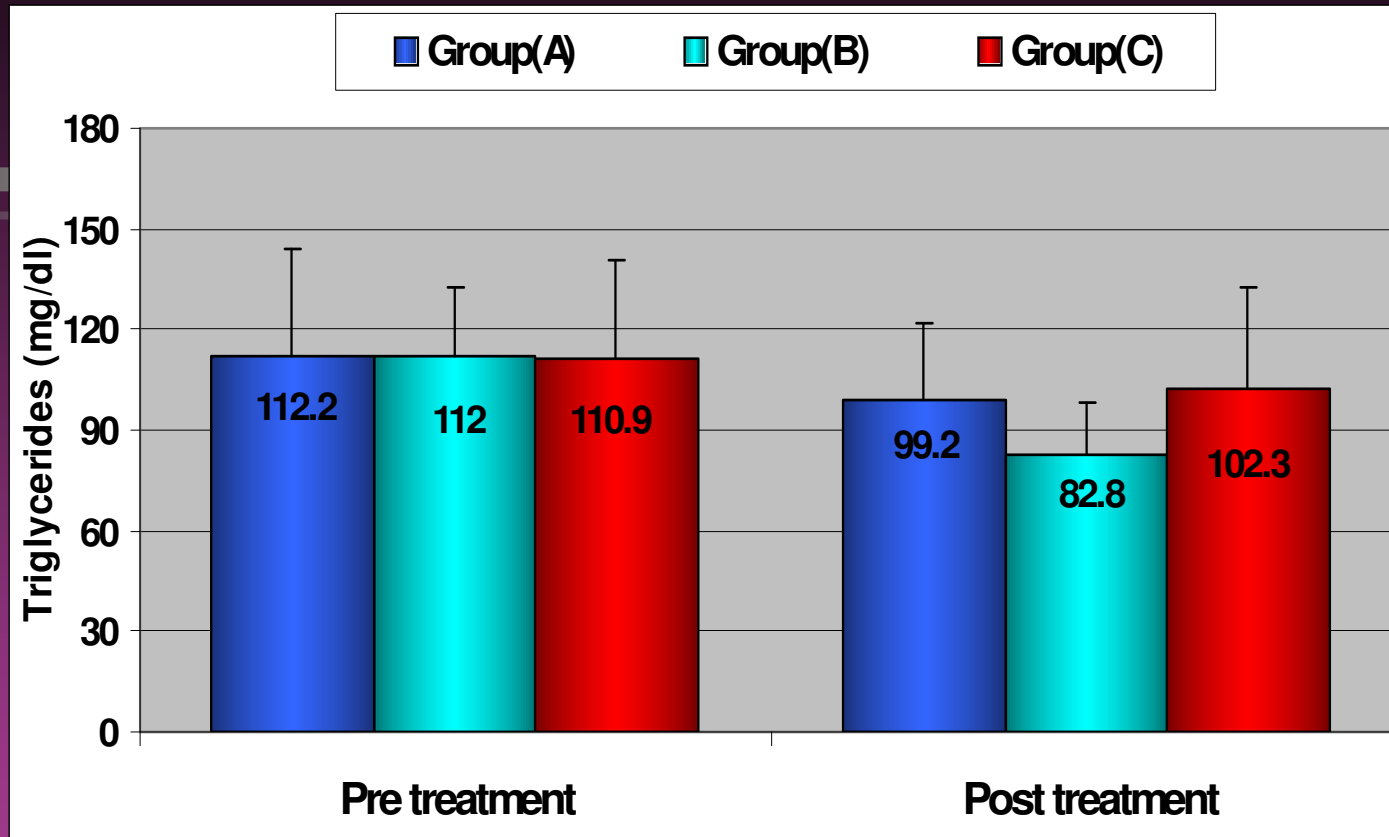**Fig (3-5):** patient on stationary bicycle.

Statistical analysis

There was a significant difference in BMI between groups A, B and C as P value was (0.0001).

With the greater improvement in group C ,the percentage of change of BMI for group (A) was 9.45% whereas, in group (B) was 5.74% and group (C) was 15.43%. as shown in fig 1
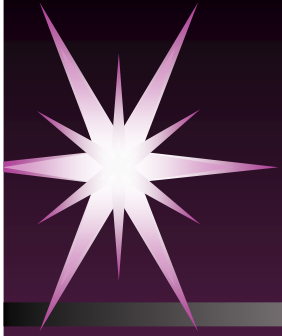
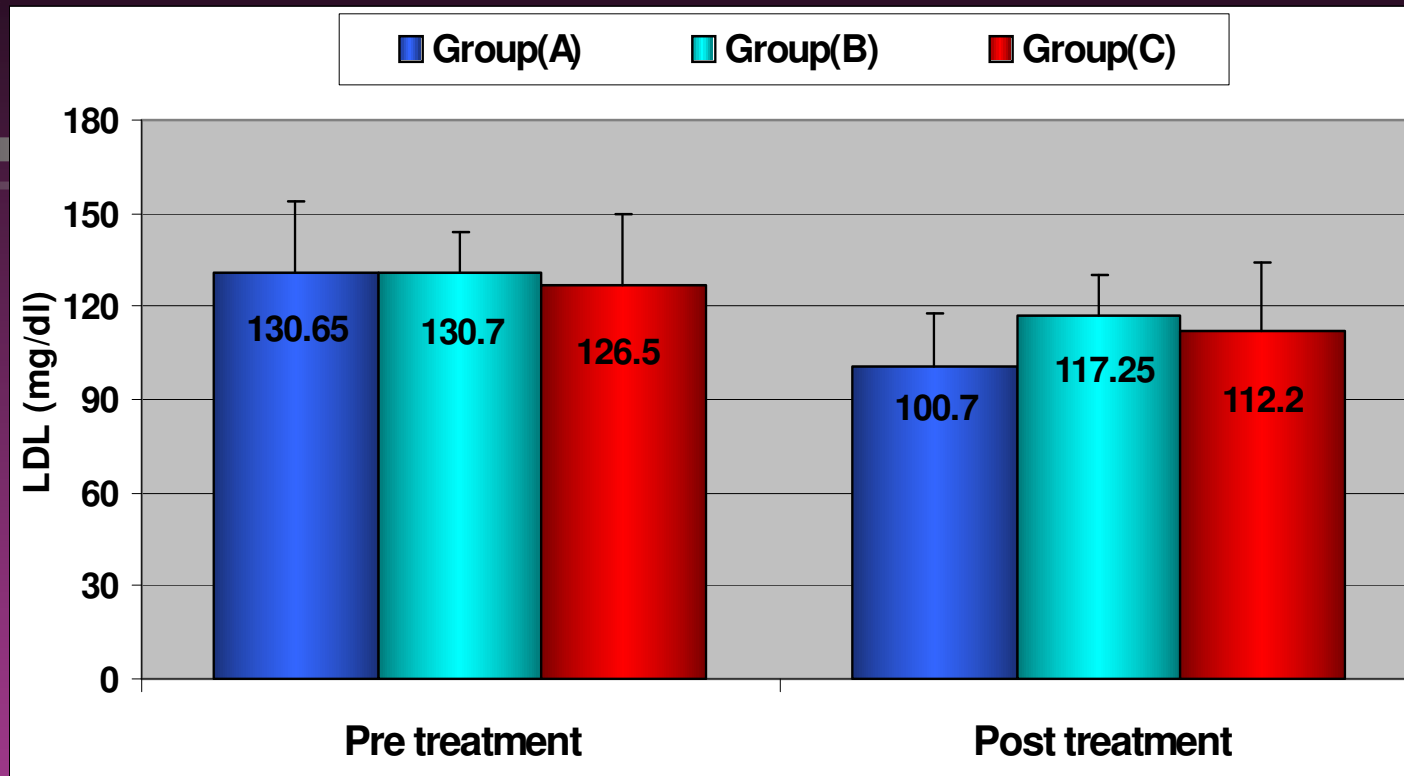**Fig. (1):** Mean and SD of BMI for the three groups Pre and post Treatment.

↗ There was a significant difference of **TG** between groups A, B and C as P value was (0.03).

↗ The greater improvement in group B The percentage of change of **TG** for group (A) was 11.58% whereas, in group (B) was 26.07% and group (C) was 7.75%. as shown in fig 2
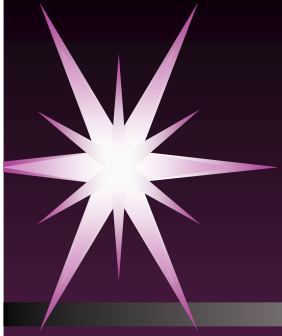
Fig. (2): Mean and SD of TG for the three groups Pre and post Treatment.
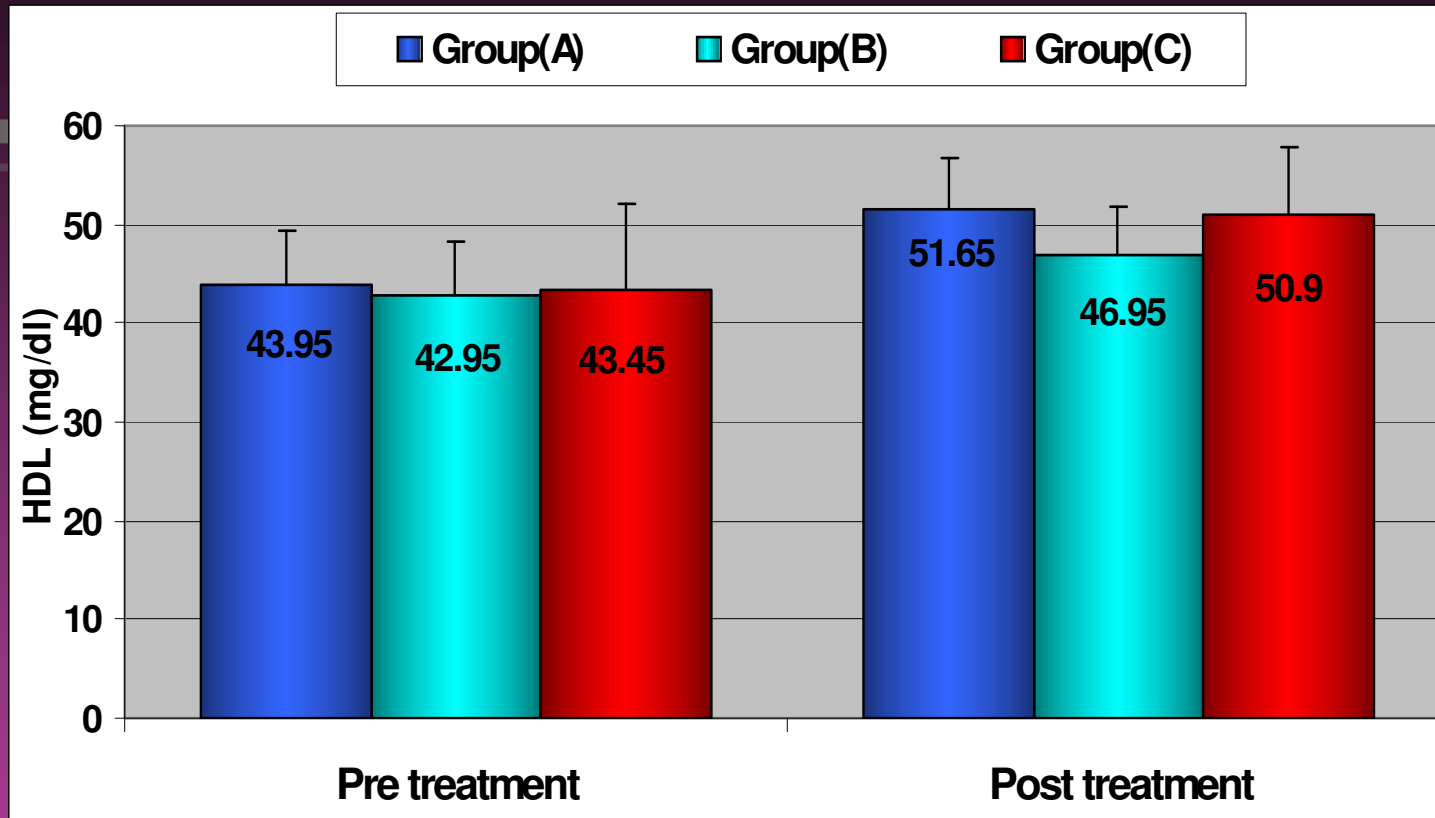
- There was a significant difference of **LDL C** between groups A, B and C as P value was (0.005).

- The percentage of change of **LDL C** for group (A) was 22.92% , group (B) was 10.29% and group (C) was 11.3%. As shown in fig. 3
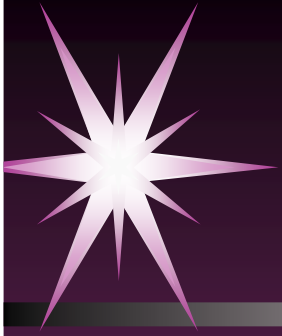
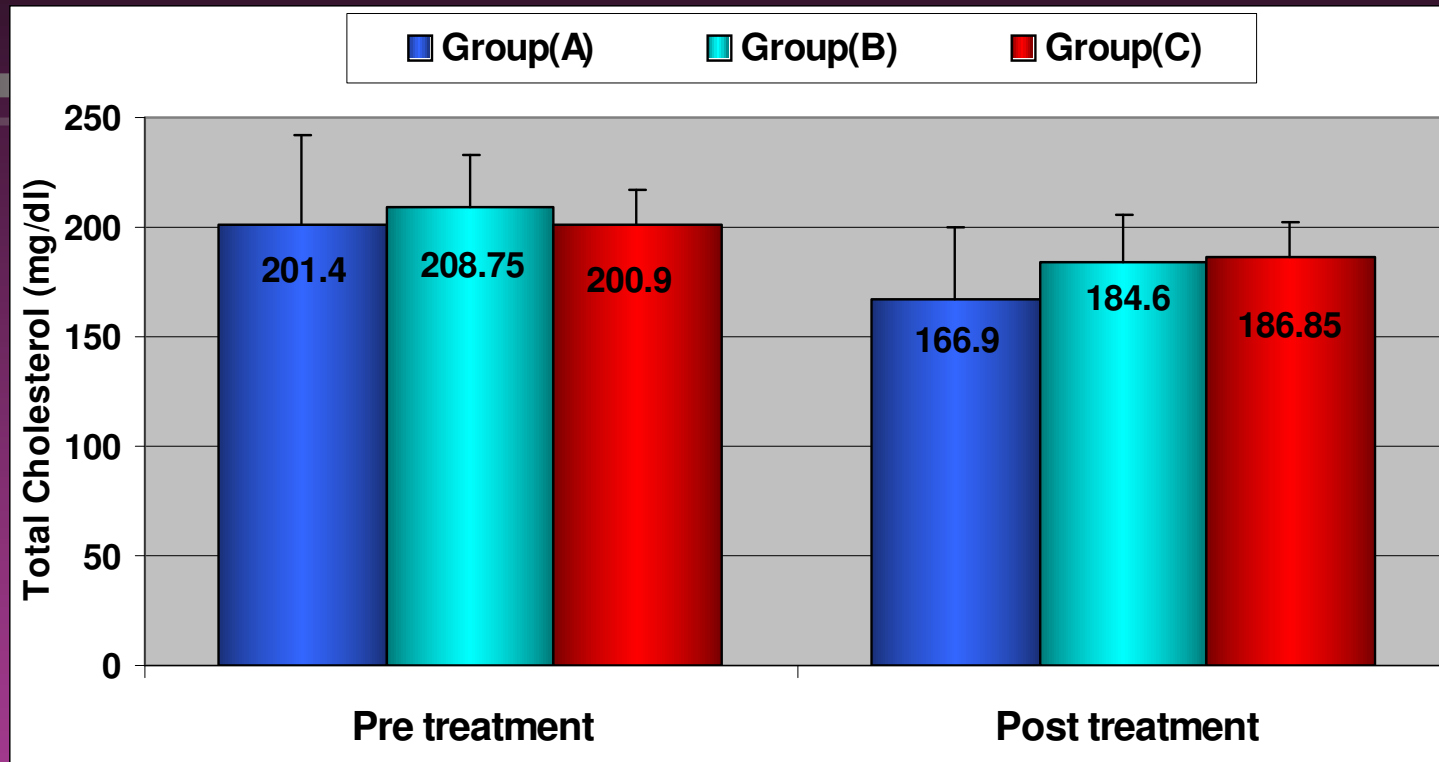**Fig. (3):** Mean and SD of LDL-C for the three groups Pre and post Treatment.

↗ There was a significant difference of **HDL C** between groups A and B and C as P value was (0.01).

↗ The greater improvement in group A

↗ The percentage of change of **HDL C** for group (A) was 17.51% whereas, in group (B) was 9.31% and group (C) was 17.14%. As shown in fig 4.

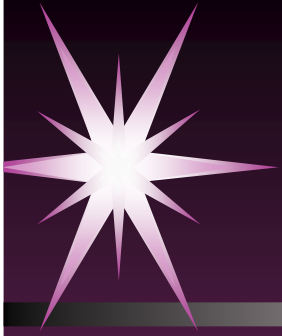**Fig. (4):** Mean and SD of HDL-C for the three groups Pre and post Treatment.

- There was a significant difference of **TC** between groups A, B and C as P value was (0.02).

- With the greater improvement in group A. The percentage of change of TC for group (A) was 17.13% whereas, in group (B) was 11.56% and group (C) was 6.99%. As shown in fig 5
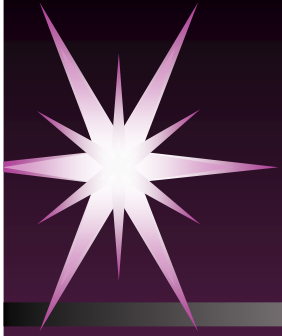
Fig. (5): Mean and SD of TC for the three groups Pre and post Treatment.

Conclusion

↗ Regarding changes in lipid profile, endurance training combined with restricted calorie diet containing olive oil or fish oil improves lipid profile better than restricted calorie diet alone in obese dyslipdemic females.

↗ Restricted calorie diet containing olive oil is effective mainly in decreasing levels of TC ,LDL-C and increasing levels of HDL-C while Restricted calorie diet containing fish oil is more effective in decreasing TG mainly .on the other hand , Restricted calorie diet alone increase HDL-C mainly