Answer on Question #63325 – Math – Statistics and Probability

Question

Ten individuals went on a low–fat diet for 12 weeks to lower their cholesterol. Evaluate the data below. Do you think that their cholesterol levels were significantly lowered? (Show all your work i.e. Ho and Ha, p-value, conclusion in words).

Starting cholesterol level	Ending cholesterol level Difference (d)
140	140
220	230
110	120
240	220
200	190
180	150
190	200
360	300
280	300
260	240

Solution

The null hypothesis $H_0: \mu_1 = \mu_2$

The alternative hypothesis $H_a: \mu_1 > \mu_2$.

It is given that $\bar{x}_d = 9$, $s_d = 24.24$.

Test statistic:

$$t = \frac{\bar{x}_d}{\frac{s_d}{\sqrt{n}}} = \frac{9}{\frac{24.4}{\sqrt{10}}} = 1.17.$$

P-value for $t = 1.17$, $degrees\ of\ freedom\ df = 10 - 1 = 9$,

level of significance $\alpha = 0.05, one - tailed\ test$:

$$p = 0.136025$$

Since the P-value (0.136025) is greater than the significance level (0.05), we cannot reject the null hypothesis.

Thus we conclude that cholesterol levels were not significantly lowered by using low–fat diet for 12 weeks at 0.05 level of significance.

Answer: cholesterol levels were not significantly lowered by using low–fat diet for 12 weeks at 0.05 level of significance.