

4.9 An experiment was conducted to evaluate the effectiveness of a work-site health program in reducing obesity as measured by a body mass index (BMI). A random sample of 12 workers received classes in exercise and diet education. The subjects were given a BMI before the program began and then after six months of the program. The data is given below. Test the claim that the program was effective in reducing body fat as measured by the BMI. Should the program be continued? Explain.

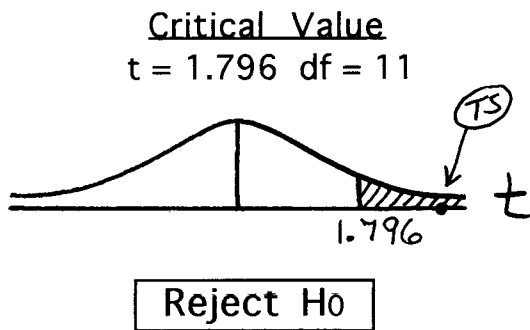
Before:	26.5	26.1	25.4	27.4	25.4	25.4	25.8	26.3	26.5	26.1	26.5	25.9
After:	<u>25.0</u>	<u>24.4</u>	<u>25.5</u>	<u>26.3</u>	<u>23.5</u>	<u>23.7</u>	<u>22.1</u>	<u>26.2</u>	<u>26.5</u>	<u>23.4</u>	<u>22.2</u>	<u>23.7</u>
Diff:	1.5	1.7	-1	1.1	1.9	1.7	3.7	.1	0	2.7	4.3	2.2

Inference About Two Means: Dependent Case Classic Before-After

Enter Before into L1
Enter After into L2
L1 - L2 -> L3

$H_0: \mu_d \leq 0$
 $\rightarrow H_1: \mu_d > 0$
 $\alpha = 0.05$

Sample Data STATS > CALC 1-Var Stats L3
 $n = 12$
 $\bar{d} \approx 1.73$
 $s_d \approx 1.386$



STAT >> TESTS 2: T-Test... use DATA L3

Test Statistic

$$t = \frac{\bar{d} - \mu_d}{\frac{s_d}{\sqrt{n}}} = \frac{1.73 - 0}{\frac{1.386}{\sqrt{12}}} \approx \boxed{4.333}$$

P-value $\approx \boxed{0.0006}$

There is sufficient evidence to support the claim that the program was effective in reducing body fat as measured by the BMI. YES, the program should be continued.

STUDY: Chapter 8: Section 8.2
 • Inference About Two Means: Dependent Case