

AS1(Assignment 1, Unit 5) Independent Measures t-test

Please write your responses in red 😊

A pharmaceutical company wishes to test the effects of a herbal supplement on anxiety levels. The researcher randomly selects a sample of $n=16$ adults from Essex County. The sample is randomly assigned to either the herbal supplement, Group B or a placebo, Group A.

Here are the data:

| GROUP "A" | GROUP " B " |
|-----------------|----------------|
| 12, 16, 18, 21, | 13, 18, 20, 16 |
| 17, 18, 18, 19 | 19, 21, 19, 22 |

1. What is the researcher's hypothesis?

Herbal Supplements will have an effect on anxiety levels.

2. What is the null hypothesis?

Herbal supplements will Not have an effect on anxiety levels.

3. What is the independent variable?

Herbal Supplements

4. What is the dependent variable?

Anxiety Levels.

5. What is the name of the *research design* in this study? Between Subject research design.

6. What is the appropriate *hypothesis test* to analyze the data from this study?

Independent Measure t-test.

7. What are the two mean “differences” you are analyzing in these data?

Control group mean and Experimental mean.

8. What is the definition of a random assignment? It’s a way of randomly placing participants in a sample into different groups. Everyone one in a sample has an equal chance of being put into the control group or the experimental group.

9. Why is using a random sample important in this study?

It allows researchers to assume that the sample represents the population, which allows the researcher to generalize the results of a study conducted on a sample back to the population.

10. If a researcher failed to use random assignment, how would this affect the research conclusion?

The researcher could not assume that the only difference between the groups is the independent variable. Instead the researcher would have to consider other variables which could be the cause of the observed effect

11. If a researcher failed to use a random sample, how would this affect the research results?

The researcher will not be able to determine the variable that had an effect on the dependent variable.

12. Run the appropriate SPSS analysis on the data and cut and paste your SPSS results here:

Group Statistics

| | VAR0000 | N | Mean | Std. Deviation | Std. Error Mean |
|---------|---------|---|---------|----------------|-----------------|
| VAR0000 | 1.00 | 8 | 17.3750 | 2.61520 | .92461 |
| 1 | 2.00 | 8 | 18.5000 | 2.87849 | 1.01770 |

Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | 95% Confidence Interval of the Difference | | | |
|----------|-----------------------------|---|------|------------------------------|--------|--------------------------|--------------------------|---|-----------------------|----------|---------|
| | | F | Sig. | t | df | Significance One-Sided p | Significance Two-Sided p | Mean Difference | Std. Error Difference | Lower | Upper |
| VAR00001 | Equal variances assumed | .149 | .705 | -.818 | 14 | .213 | .427 | -1.12500 | 1.37500 | -4.07408 | 1.82408 |
| | Equal variances not assumed | | | -.818 | 13.873 | .214 | .427 | -1.12500 | 1.37500 | -4.07661 | 1.82661 |

13. Based on your SPSS results, please answer the following questions:

(a) What is the appropriate decision, reject the null or fail to reject the null? Fail to reject the null Hypothesis.

(b) Write the “statistical statement” of your SPSS analysis: $t(14) = .213, P > .05$ _____

(c) Please write your results as they might be written in a research study (refer to the “In the Literature” section of chapter 10 of your textbook).

There was not a significant difference between the groups. With these results there is a probability of a type II error because we failed to reject the null Hypothesis.

(d) Is there a probability of Type I error? Yes _____ No x _____

(e) Is there a probability of Type II error? Yes x _____ No _____