

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?

The herbal supplement WILL affect anxiety levels.

2. What is the null hypothesis?

The herbal supplement will NOT affect anxiety levels.

3. What is the independent variable?

The herbal supplement

4. What is the dependent variable?

The anxiety levels.

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

A Between-Subjects- Design

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

Independent Measures t-test

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

The two mean differences I am analyzing are the control/placebo group (Group A) and the experimental group (Group B).

8. What is the definition of a random assignment?

Random assignment can be defined as everyone in the 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?

The random sample is important in this study because it allows the researcher to make an important and necessary assumption.

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

If a researcher failed to use random assignment, he/she can not assume that the only difference between the groups is the independent variable.

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

If a researcher failed to use a random sample, this can cause the research results to not infer or make generalizations about the population of interest.

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

Group Statistics

	VAR00002	N	Mean	Std. Deviation	Std. Error Mean
VAR00001	1.00	8	17.3750	2.61520	.92461
	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							
		F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						One-Sided p	Two-Sided p			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? Reject the null.

(b) Write the “statistical statement” of your SPSS analysis: $t(14) = -0.818, p < .05$

(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).

The mean for the group that did not receive the herbal supplement was $M = 17.37$ with an $SD = 2.61$. The mean for the group that did receive the herbal supplement was $M = 18.50$ with an $SD = 2.87$. The data shows herbal supplements do affect anxiety levels. The data show a significant difference between the groups, $t(14) = -.818, p < .05$

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

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