

HSCC 470

Research Methods and Data Analysis in Health Sciences

Using SPSS: The Paired t Test

HSCC 470 Using SPSS: The Paired t Test



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Unit Objectives

Upon completion of this unit, the student will be able to:

- List the assumptions of the paired t test.
- Describe when a paired t test is appropriate for testing a hypothesis.
- Use SPSS to conduct a paired t test and correctly interpret the output.

HSCC 470 Using SPSS: The Paired t Test



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Statistical Methods to Test Hypotheses

Scale of Measurement	Two Treatment Groups Consisting of Different Individuals	Three or More Treatment Groups Consisting of Different Individuals	Before and After a Single Treatment in the Same Individuals	Association Between Two Variables
Interval	Unpaired t test	ANOVA	Paired t test	Linear Regression and Pearson Correlation
Nominal	Chi-square	Chi-square	McNemar's test	Contingency Coefficients
Ordinal	Mann-Whitney rank-sum test	Kruskal-Wallis statistic	Wilcoxon signed-rank test	Spearman Rank Correlation

Assumptions of the Paired t Test

- Continuous data
- Data measured on an interval or ratio level
- Only 2 groups are being compared
- The groups are dependent
- Data drawn from a normally distributed population
- Comparing means

Conducting a Paired t Test Using SPSS

- **Assumptions**
 - Scale of measurement
 - Continuous data measured on an interval scale
 - Population distribution
 - Kolmogorov-Smirnov Test – $p > 0.05$
 - Method of sampling
 - Randomized, 2 dependent samples
 - Sample size
 - Control $N = 50$
 - Experimental $N = 50$

Conducting a Paired t Test Using SPSS continued

- **Hypotheses**
 - Null
 - There is no difference in paramedics' knowledge of 12 lead EKG interpretation following completion of an on-line course, when compared with knowledge levels before the course.
 - Alternative
 - There is a difference in paramedics' knowledge of 12 lead EKG interpretation following completion of an on-line course, when compared with knowledge levels before the course.
- **Select Alpha Level**
 - Alpha = 0.05
- **Test statistic**
 - Paired t Test

Conducting a Paired t Test Using SPSS continued

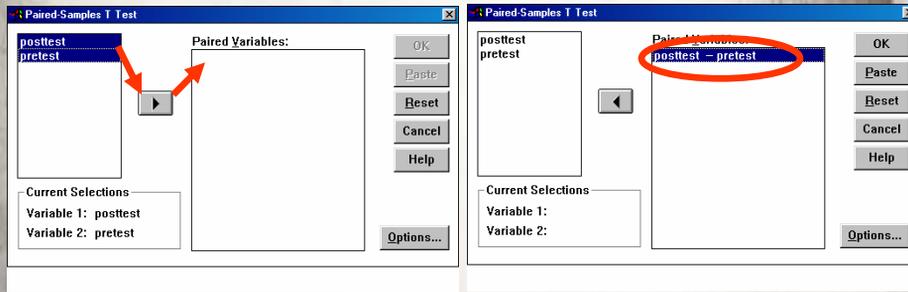
- P -value
- Conclusion

Conducting a Paired t Test Using SPSS

The screenshot shows the SPSS for Windows interface. The 'Statistics' menu is open, and 'Paired-Samples T Test...' is selected. The data editor shows a dataset with two columns of scores for 10 subjects.

	pretest								
1	64								
2	61								
3	76								
4	72	73							
5	67	76							
6	64	89							
7	55	85							
8	64	77							
9	74	86							
10	77	81							

Conducting a Paired t Test Using SPSS continued



Conducting a Paired t Test Using SPSS continued

The screenshot shows the SPSS Output window with the following data:

Variable	Number of pairs	Corr	2-tail Sig	Mean	SD	SE of Mean
POSTTEST	50	-.170	.237	79.6600	8.126	1.149
PRETEST				66.3200	7.444	1.053

Paired Differences			t-value	df	2-tail Sig
Mean	SD	SE of Mean			
13.3400	11.917	1.685	7.92	49	.000
95% CI (9.953, 16.727)					

Conducting a Paired t Test Using SPSS continued

- **P -value**
 - $P = 0.000$
- **Conclusion**
 - P value is less than alpha. Therefore, we reject the null hypothesis and conclude that there is a difference in paramedics' ability to interpret 12 leads following an on-line course, when compared with their pre-course scores.

