

# Free research paper about conducting z- test

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## **Solution**

A researcher predicts that watching a film on institutionalization will change students' attitudes about chronically mentally ill patients. The researcher randomly selects a class of 36 students, shows them a film, and gives them a questionnaire about their attitudes. The mean score on the questionnaire for these 36 students is 70. The score for a similar class of students who did not see the film is 75. The standard deviation is 12. Using the five steps of hypothesis testing and the 5% significance level (i. e.  $\alpha = .05$ ), does showing the film change students' attitudes towards the chronically mentally ill? Answer the following:

1) What does it mean to set alpha at .05?

This means the level of significance of the test (the probability of type 1 error). It is the probability of that the null hypothesis will be mistakenly rejected.

2) What is your null hypothesis? Alternate hypothesis?

My null hypothesis is that there is no significant difference in average questionnaire score between students who didn't see the film and students who did.

**My alternative hypothesis is that the score for students who did not see the film is higher**

3) Is this one tailed or two tailed hypothesis?

## **One-tailed**

4) What is critical Z?

The critical z-level is the limit of rejection region of the null hypothesis. If the

calculated absolute value of z-score observed is lower than z-critical, we have no evidence to reject the null hypothesis. If higher, then we can reject it.

### **In our case, observed z-value is:**

$$z = \frac{x - \mu}{\sigma/\sqrt{n}} = \frac{70 - 75}{126/\sqrt{26}} = -2.5$$

5) Suppose the obtained Z was -2.5. Do you reject or fail to reject the null hypothesis?

For 5% level of significance the corresponding z-critical (according to the standard normal table) is 1.96. Since observed absolute value is higher than critical, we reject the null hypothesis and state, that there is a significant difference in score of the questionnaire between the groups of students.

6) State in words what you have found. Please be sure to use APA references on reference page.

At 5% level of significance we have enough evidence to state, that there is a difference between scores of the questionnaire between the groups of students.

### **Sources**

Carroll, Susan Rovezzi; Carroll, David J. (2002). *Statistics Made Simple for School Leaders* (illustrated ed.). Rowman & Littlefield. ISBN 978-0-8108-4322-6. Retrieved 7 June 2009

Richard J. Larsen and Morris L. Marx (2000) *An Introduction to Mathematical Statistics and Its Applications*, Third Edition, ISBN 0-13-922303-7. p. 282.