1. Determine whether the data provided is appropriate for the test(s) available and that any analysis is achievable.

2. Formulate a hypothesis test to be used to compare the effectiveness of the two approaches (control, meditation) used during dental surgery.

3. Analyse the data to provide the hypothesis testing conclusion.

4. Provide descriptive statistics (graphs and tables) of the data.

5. Determine the 95% confidence interval for the population mean of each group, and the 95% confidence interval for the difference between the means of the two groups.

# Q1: Determine whether the data provided is appropriate for the test(s) available and that any analysis is achievable.

A1: The study consisted of 100 patients, using random sampling, np>= 10

# Answer

# Null and alternative hypotheses.

**Null hypothesis:** There is no difference in the average of the two methods(Meditation & Control), which indicate the Mean difference between the two methods is equal to zero or there is no difference in means.

Let’s write our Null Hypothesis as follow:

**H0:** **μMeditation = μControl**

**Alternative hypothesis:** There is a difference in average for the two methods(Meditation & Control), therefore the mean difference is not equal to zero or the two means are not equal.

**H1: The means are not equal.**

# Summary data.

**Quantitative variables:**

|  |  |  |
| --- | --- | --- |
|  | GSR | VNRS |
| n | 50 | 50 |
| Mean | 6.847 | 7.9 |
| Min | 5 | 6 |
| Max | 8.9 | 9 |
| 1st Quartile | 6.3 | 7.75 |
| 2nd Quartile | 6.8 | 8 |
| 3rd Quartile | 7.3 | 8 |
| 4th Quartile | 8.9 | 9 |

**Qualitative variables:**

|  |  |
| --- | --- |
| **Type** | **n (%)** |
| Meditation | 50 (50%) |
| Control | 50 (50%) |
| Male |  |
| Female |  |

**GSR:**

The sample mean difference for GSR:

MeanGSR = MeanMed – MeanCTRL

MeanGSR = 6.654 - 7.04

MeanGSR = **-0.386**

So there is a difference between the 2 means or μGSR = μVNRS, therefore H1 is true.

**Sample proportion**

**The standard error**

The standard error of the difference is 0.156287172.

**Z Value:**

**VNRS:**

The sample mean difference for VNRS:

MeanVNRS = MeanMed – MeanCTRL

MeanVNRS = 7.78 - 8.02

MeanVNRS = **-0.24**

So there is a difference between the 2 means or μGSR = μVNRS, therefore H1 is true.

**Sample proportion**

**The standard error**

The standard error of the difference is 0.134996296.

**Z Value:**