Homework assignment 07

Use black text (if possible) for everything you include in this document. Keep both your answers and the original questions. Save this document in PDF format and submit it on Canvas. Include your last name, the course number and the module number in the name of your file.

For every assignment, make sure that your graphs conform to the following requirements:

* Do not display unnecessary decimal places on your graph axes.
* Include units of measurement (when appropriate) on graph axis labels
* Avoid the unnecessary use of color unless color is needed to distinguish between groups. Fill boxes and points with white or transparent colors.
* Include ticks on both axes
* Replace the default title provided by SPSS with one that includes your name and the date
  + For example, “This scatterplot was produced by Steve Simon on 2023-09-19”

You do not need to show any dialog boxes or program code. You are welcome to use a program other than SPSS (e.g., Python, R, SAS, Stata) if you are adventurous.

1. Show a documentation header. The documentation header is a description of who wrote the program, when it was written, what the purpose of the program is (briefly), and what restrictions (if any) that you may place on the program. For SPSS, you can just type the documentation as free format text. For other programs, you might use the comment feature (such as /\* and \*/ in SAS).

2. Download the file data-07-sway.txt. Import the data into SPSS. Show the first ten rows of data here.

3. Draw plots comparing the front-to-back sway value between the two age groups. Repeat for the side-to-side sway value. Show the graphs below.

4. Do the boxplots show any problems with non-normality and/or heteroscedascity?

5. Calculate an independent samples (two sample) t-test in SPSS for testing the one-tailed hypotheses that elderly patients have a greater average sway. Do two separate tests, one for front-to-back sway and one for side-to-side sway. Show the dialog box or program code along with all of the output.

6. Show the hypothesis for these tests using Greek letters (mu1 and mu2). Define what 1 and 2 represent. Summarize the results of the t-tests in a language suitable for a journal article.

7. Download the file data-07-reiki.txt. Import the data into SPSS. Show the first ten rows of data here.

8. Calculate the difference between VAS.before and VAS.after and the difference between Likert-before and Likert-after. Show the first ten rows of data after computing these variables.

9. Draw histograms and Q-Q plots for both of these differences. Show the results below.

10. Do these plots suggest a problem with non-normality.

11. Calculate a paired differences t-test for VAS and Likert measures of pain.

12. Show the hypothesis for these tests using Greek letters. Summarize the results of these tests in a language suitable for a journal article.

13. Explain why some researchers might object to the use of t-tests for the VAS or Likert measures of pain?

14. The analysis of skin barriers for pediatric burn victims had a second important outcome, the cost of treatment. For the currently used barrier, the average cost was $20 with a standard deviation of $2.50. An average difference of $1 would be considered clinically important. What sample size would you need using the rule of 16. Show your intermediate calculations.

15. Use the SPSS program to estimate the sample size for the above scenario with a two-tailed test and an alpha level of 0.05. You want to have power of 0.8. Show the output below.

16. Briefly interpret this output.