

You may work with one partner on this assignment, submitting one report with both names, provided that both students contribute substantially to the work. Word-processed reports are preferred to hand-written ones. Please copy/paste relevant computer output into your report as appropriate.

Fish Oil or Regular Oil?

Researchers randomly assigned 14 male volunteers with high blood pressure to one of two diets for four weeks: a fish oil diet and a regular oil diet. The subjects' diastolic blood pressure was measured at the beginning and end of the study, and the reduction was recorded for each subject (based on a study published in the *New England Journal of Medicine*). Prior to conducting the study, researchers conjectured that those on the fish oil diet would tend to experience greater reductions in blood pressure than those on the regular oil diet. The results were:

Fish oil diet:	8	12	10	14	2	0	0
Regular oil diet:	-6	0	1	2	-3	-4	2

- Identify the explanatory and response variables. Also classify each as being categorical or quantitative.
- Is this a randomized experiment or an observational study? Explain.
- Construct dotplots of the distributions of blood pressure reductions between the two groups. Comment on the dotplots reveal about the distributions of blood pressure reductions between the two groups.
- Calculate the mean and median blood pressure reductions in each group. Does the "fish oil" group have a higher mean and median reduction than the "regular oil" group? Is this consistent with the researchers' conjecture?
- How many ways are there to randomly assign 14 subjects into two groups of 7 each?
- Determine the exact p-value of the randomization test for these data. [*Hint: Do not attempt to determine the entire randomization distribution. Just count how many of the possible random assignments produce a difference in group means as favorable to the researchers' conjecture as the actual study. Justify your answer either by listing all of these outcomes or describing how you do the counting.*]
- Summarize your conclusions from this study. Include an explanation of the reasoning process behind your conclusion. Be sure to address the issues of causation (i.e., is a cause-and-effect conclusion warranted?) and generalizability (i.e., how broadly can you legitimately generalize your conclusion?), as well as the issue of statistical significance.