

Two-Sample T-test

Objective: Compare means of two groups of independent samples.

A researcher wants to compare the effectiveness of two weight loss programs: 1) a self-guided program and 2) an intensively coached program. She plans to randomize participants equally into the two programs. The outcome of interest is weight loss (kg). From the literature, the researcher learned that a similar study found weight loss of 7 kg for a self-guided program with a standard deviation for the change in weight of 6 kg. The investigator wants to detect a difference between the two programs of at least 3 kg at 90% power with a significance level of 5%.

Required Information	Inputs
What is the desired power for the test?	90%
At what significance level do you want to test your hypothesis?	5%
What is the mean of the control group?	7
What difference in means do you want to be able to detect?	3
What is the standard deviation of the response variable?	6
Is your hypothesis one-sided or two-sided?	Two-sided
What will the ratio of samples be in the intervention group to the control group?	1:1

Statistical Tools

Two Arm Normal

Two Arm Normal is a program to calculate either estimates of sample size or power for differences in means. The program allows for unequal sample size allocation between the two groups.

User Input | Program Output

Select Calculation and Test Type

Sample Size | 1 Sided
 Power | 2 Sided

Select Hypothesis Test Parameter

Mean: Arm 1	Mean: Arm 2	Standard Deviation	Ratio of Sample Size Arm2/Arm1	Alpha
7	10	6	1	.05

Power: .90 | Total Sample Size: 169

Calculate | [Help Document](#)

With effect size of 3, mean of coached program would be 10.

A total sample size of at least 169 is necessary, meaning 85 participants in each group for a total of 170.

Example using the Southwest Oncology Group's Statistical Tools (<https://stattools.crab.org/>)