Example: Performing t-test in SPSS

Statistical Package for the Social Sciences

Q. Determine whether the new drug has an impact in reducing blood pressure of patients?

You need to first check the two assumptions:
 i) whether blood pressure is normally distributed and
 ii) whether the variance is equal between the two groups (Homogeneity of variance test). Write down the null and alternative hypotheses for the normality test:

Null Hypothesis (Ho): Blood pressure is normally distribution.

Alternative Hypothesis (H1): Blood pressure is not normally distribution.

Gr.	Placebo	Gr.	New Drug
1	90	2	71
1	95	2	79
1	67	2	69
1	120	2	98
1	89	2	91
1	92	2	85
1	100	2	89
1	82	2	75
1	79	2	78
1	85	2	80

Normality Test

Follow these steps to perform the normality test:

From the menu bar select **Analyze -> Descriptives Statistics ->
  Explore…**.

Transfer *blood pressure* [*bloodpres*] to **Dependent List:**.

Transfer *Group Membership* [*group*] to **Factor List:**.

From **Display** click on **Plots**. Then click on **Plots…**.

Under **Descriptive** deselect **Stem-and –leaf**.

Select **Normality plots with tests**.

Click on **Continue**. Click on **OK**.

Examine the result on the table Tests of Normality. For a small sample size (n≤50) use the Shapiro-Wilk statistic. For large sample size (n>50) use the Kolmogorov-Smirnov statistic.

Is blood pressure from the placebo group normally distributed? Why?

Is blood pressure from the new drug group normally distributed? Why?

Overall, what would you conclude?

Write down the null and alternative hypotheses for the Homogeneity of variance test:

Null Hypothesis (Ho): The variance is equal between the two groups.

Alternative Hypothesis (H1): The variance is not equal between the two groups.

Homogeneity of variance test

Follow these steps to perform the homogeneity of variance test:

Select **Analyze -> Compare Means -> One-Way ANOVA…**.

Transfer *blood pressure* [*bloodpres*] to **Dependent List:**.

Transfer *Group Membership* [*group*] to **Factor**.

Click on **Options** and select **Homogeneity of variance test**.

Click **Continue** and click **OK**.

Examine the table **Test of Homogeneity of variance**. What would you conclude? Ignore the table **ANOVA** which is also produced as part of this procedure.

Independent Samples T Tests

Since blood pressure passed the two assumptions, that is, blood pressure was normally distributed and the variances between the two groups are equal, we have to perform a parametric t test.

Write down the null and alternative hypotheses for the Independent Samples T Tests:

Null Hypothesis (Ho): The average blood pressure is the same between the placebo group and new drug group.

Alternative Hypothesis (H1): The average blood pressure is different between the placebo group and new drug group.

Follow these steps to perform the test:

1)Select **Analyze -> Compare Means -> Independent-Samples T Test...**.

2) Transfer *blood pressure* [*bloodpres*] to **Test Variable(s):**.

3) Transfer *Group Membership* [*group*] to **Grouping Variable:**.

4) Click on **Define Groups**. Beside **Group 1:** type *1*. Beside **Group 2:** type *2*.

5) Click on **Continue** and click on **OK**.

Examine the output. Notice that two tables are produced. Using the table **Group Statistics** answer these questions.

What is the average blood pressure for the placebo group?

What is the average blood pressure for the new drug group?