

Basic SPSS command to open a SPSS file:
GET FILE= 'Drive name:\folder name\file name'.

C.2 One-way ANOVA and Tukey Test

To investigate that HDL levels in three groups: normal, coronary artery disease patients and diabetes patients are different or not, 50 subjects in each group were randomly selected from their respective population and their HDL level recorded.

Tests to be used: One-way analysis of variance F -test followed by Tukey test at 5% level of significance for pairwise comparisons.

One-way ANOVA has two main assumptions, namely, homogeneity of variances across the groups and independence of observations. Independence in this case is assured as the observations belong to separate subjects. Homogeneity of variances can be tested using Levene test. For pairwise comparisons Tukey test is used. Gaussianity is assumed as the number of subjects in each group is 50, which is reasonably large.

Command to run the one-way ANOVA, Levene test, and Tukey test:

```
ONEWAY
  HDL BY Group
  /STATISTICS DESCRIPTIVES HOMOGENEITY
  /MISSING ANALYSIS
  /POSTHOC = TUKEY ALPHA(.05).
```

This command displays the mean, SD, SE and 95% CI for each group, Levene test for homogeneity of variance, and post-hoc Tukey test at 5% level. Controls are the normal subjects.

Descriptives

HDL									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
Control	50	43.9800	8.09507	1.14482	41.6794	46.2806	32.00	64.00	
CAD	50	33.9600	6.24650	.88339	32.1848	35.7352	22.00	50.00	
Diabetic	50	41.5400	7.12343	1.00741	39.5155	43.5645	23.00	56.00	
Total	150	39.8267	8.33022	.68016	38.4827	41.1707	22.00	64.00	

Test of Homogeneity of Variances

HDL			
Levene Statistic	df1	df2	Sig.
1.644	2	147	.197

The Levene test is not significant ($P = 0.197$), which indicates that condition of homogeneity of variances is not violated. The following is the ANOVA table.

ANOVA Table

Dependent Variable: HDL

Source of variation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2730.173	2	1365.087	26.371	.000

Within Groups	7609.320	147	51.764		
Total	10339.493	149			

The value of F shows that between-groups mean square is more than 26 times the value of within-groups mean square. This is highly significant and indicates that group means are very different. The following Tukey test shows where the difference lies.

Tukey HSD

Group (I)	Group (J)	Mean Difference (I-J)	Sig.
Normal	CAD Patients	10.02000(*)	.000
	Diabetic Patients	2.44000	.210
CAD Patients	Diabetic Patients	-7.58000(*)	.000

* The mean difference is significant at the 0.05 level by Tukey test

Mean HDL of CAD patients is significantly different from the mean of normal subjects as well as from the mean of diabetic patients. Mean HDL of diabetic patients is not significantly different from normal subjects.

To plot the mean plus/minus 1SD bar in SPSS, the following command can be used.

GRAPH

```
/BAR (SIMPLE) =MEAN (HDL) BY Group
/INTERVAL SD (1.0) .
```

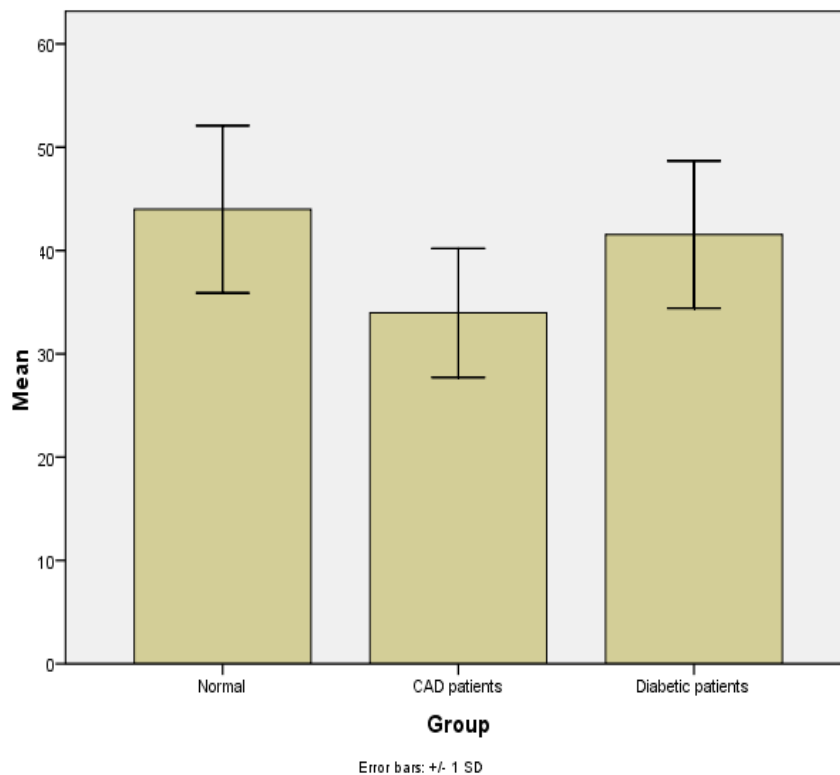


FIGURE C.2 Mean HDL with ± 1 SD in the three groups