Unit Objectives

Upon completion of this unit, the student will be able to:

– List the assumptions of the analysis of variance (ANOVA) test.
– Describe when the ANOVA test is appropriate for testing a hypothesis.
– Use SPSS to conduct an ANOVA test and correctly interpret the output.

### Assumptions of the ANOVA Test

- Continuous data
- Data measured on an interval or ratio level
- 3 or more groups are being compared
- The groups are independent
- Data drawn from a normally distributed population
- Comparing means

### Statistical Methods to Test Hypotheses

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### Conducting an ANOVA Test Using SPSS

- **Assumptions**
  - Scale of measurement
    - Continuous data measured on an interval scale
  - Population distribution
    - Kolmogorov-Smirnov Test – \( p > 0.05 \)
  - Method of sampling
    - Randomized, 3 or more independent samples
  - Sample size
    - Control, \( N = 50 \)
    - Experimental, \( N = 50 \)
    - Experimental, \( N = 50 \)
- **Hypotheses**
  - Null
    - There is no difference in the ejection fraction of MI patients 3 weeks post-MI who receive TPA, Streptokinase, or a placebo.
  - Alternative
    - There is a difference in the ejection fraction of MI patients 3 weeks post-MI who receive TPA, Streptokinase, or a placebo.
- **Select Alpha Level**
  - \( \alpha = 0.05 \)
- **Test statistic**
  - ANOVA
Conducting an ANOVA Test Using SPSS continued

- **P-value**
- **Conclusion**

- **P-value**
  - $P = 0.000$

- **Conclusion**
  - $P$ value is less than alpha. Therefore, we reject the null hypothesis and conclude that there is a difference in ejection fraction between the 3 treatment groups.
• In our prospective evaluation of ejection fraction 3 weeks post-MI, we found statistically significant differences among those treated with streptokinase and tPA as compared with placebo. The ejection fractions were 66.33 (95% CI 64.70-68.36), 70.33 (95% CI 69.14-71.52) and 50.05 (95% CI 48.91-51.19) respectively. These results were significant at the 0.05 level (F=226.15, p = 0.000).