Power Analysis by: Melodee Harris, PhD, APN, GNP-BC

Researchers use a power analysis to determine the sample size before conducting the study and to determine statistical significance after the study is completed. This is important when one is conducting a study that has as its purpose determining the benefit of one treatment/intervention over another. There are a variety of computer programs that may be used to calculate a power analysis. In holistic nursing research, this may be more of a challenge as multiple factors may be contributing to the affect a particular treatment/intervention has on the participant.

Power is a function of effect size and sample size. Effect size denotes the degree of relationship between the research variables. A power analysis is the combined effect size and sample size and is used to make a more precise prediction of the study results. A small effect size requires a larger sample size. If the intervention has a large effect size, fewer responses or participants are needed. Cohen sets a range to determine a small, medium, and large effect size. Effect size may be referred to as Cohen's 'd'. Sometimes the ranges are used to estimate these values and sometimes the effect size is estimated from previous research.

A power analysis that meets ethical standards is performed prior to conducting the study in order to determine resources needed to carry out the research. A sample size that is larger than necessary wastes valuable resources and places an unnecessary burden on participants. A sample size that is underpowered will not determine conclusive results of a study. It is important to remember that a power analysis is only a calculated estimate that provides the researcher with an objective means for guiding a scientific basis for the statistical significance of the study.