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MSc Applied Social & Health Psychology

M7X01449 *Applied Research, Ethics & Analysis*

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Summary Worksheet of Key Formula's

Formulae for Altman's Nomogram to calculate sample size

Independent samples t-test =

$$\frac{\delta}{\sigma}$$

δ : is the smallest difference in means that is clinically important.
 σ : assumed equal standard deviation of the observations in each of the 2 groups

Paired samples t-test =

$$\frac{2\delta}{\sigma_d}$$

δ : is the smallest mean difference that is clinically important.
 σ_d : the standard deviation of the differences in responses

Chi-Squared test =

$$\frac{P_1 - P_2}{\sqrt{\bar{P}(1 - \bar{P})}}$$

$P_1 - P_2$: smallest difference in the proportion of 'success' in the 2 groups

To calculate $\bar{p} = \frac{p_1 + p_2}{2}$

Calculating effect size using Eta-Squared

Independent samples t-test =

$$\frac{t^2}{t^2 + (N_1 + N_2 - 2)}$$

Paired samples t-test =

$$\frac{t^2}{t^2 + (N - 1)}$$

Confidence Intervals (CI) of the Mean

With large sample size and normal distribution use:

Sample mean – (1.96 x SEM), sample mean + (1.96 x SEM)

If the variance in the population is not known and/or the sample size is small use:

Sample mean – (t.05 x SEM), sample mean + (t.05 x SEM).

- Notes:
 - t.05 = the percentage point of the t-distribution with (n-1) degrees of freedom and a two-tailed probability.
 - SEM = Standard Error of the Mean
 - To calculate $SEM = \frac{SD}{\sqrt{\text{sample}}}$

Confidence Intervals (CI) for the Proportion

Proportion in the sample: $p = r/n$

- r is the number of individuals in the sample with the characteristics of interest.
- The standard error is estimated by: $\sqrt{\frac{p(1-p)}{n}}$

The 95% confidence interval for the proportion is:

$$p - \left[1.96 \times \sqrt{\frac{p(1-p)}{n}} \right], \quad p + \left[1.96 \times \sqrt{\frac{p(1-p)}{n}} \right]$$