Sample size calculation

Parameters:

- Type I error = 0.05
- Type II error = 0.20
- k = 2
- hypothesized ICC = 0.80

$$n = \frac{0.5\ k\ (Z\alpha + Z\beta)\text{^}2}{\sigma 2\ (k-1)} + 2$$

$Z\alpha = 1.645$

$Z\beta = 0.842$

$R_{expected} = 0.80$

$$Z_{Rexpected} = 0.5 \text{ natural log } \frac{1+(k-1)Rexpected}{1-Rexpected}$$

$Z_{Rexpected} = 1.0986$

$R_{lowerlimit} = 0.80 - 0.10 = 0.70$

$$Z_{Rnull} = 0.5 \text{ natural log } \frac{1+(2-1)0.70}{1-0.70}$$

$Z_{Rnull} = 0.867$

$\sigma^2 = Z_{Rexpected} - Z_{Rnull}$

$\sigma^2 = 0.2316$

$$n = \frac{0.5\ k\ (Z\alpha + Z\beta)\text{^}2}{\sigma 2\ (k-1)} + 2$$

n = 28.706

Sample size = 29 participants round to 30 participants

Sample size adjusted for attrition rate of 25% = 30 ÷ (1-0.25) = 40

Final sample size = 40 participants