**Statistical Analysis for ‘Don’t Just Sit There’**

**To: Dr.Bingenheimer**

**From: Jaclyn Batts**

**RE: Evaluation of Statistical Tests**

**Date: 02/25/2025**

**Table 1: Paired t-test Results in the Treatment Group(Full Sample,n=145)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Pretest** | |  | **Posttest** | | |  | | **t-test** | |
|  | **Mean** | | **(SD)** |  | **Mean** | **(SD)** | **Diff.** | | **p-value** | | |
| **Self-Efficacy** | 2.89 | | (0.82) |  | 3.56 | (0.92) | | -0.67 | | 0.000 | |
| **Value-Expectancy** | 1.73 | | (1.06) |  | 1.75 | (1.26) | | -0.03 | | 0.786 | |
| **Physical Activity (mean cycles per minute)** | 505.40 | | (163.55) |  | 597.75 | (251.20) | | -92.34 | | | 0.000 |
| **Heart Rate (beats/minute)** | 99.61 | | (8.99) |  | 95.78 | (11.76) | | 3.83 | | 0.000 | |

According to **Table 1**, physical activity showed the most significant improvement from the intervention, with an increase of **92.34** cycles. In addition to the increased physical activity, heart rate decreased by **3.83**, indicating improved cardiovascular fitness. However, value expectancy with a p-value more significant than 0.05 showed no statistical significance, suggesting the intervention did not change participants’ beliefs about the benefits of being physically active.

**Table 2: Change in Proportion of Participants with Poor Fitness(Full Sample, n=45)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Pretest** | |  | **Posttest** | | | **t-test** | |
|  | **Mean** | | **(SD)** |  | **Mean** | **(SD)** | **(p-value)** | |
| **Poor Fitness (HR > 110 bpm)** | 0.117 | | (0.32) |  | 0.110 | (0.31) | | **McNemar Exact Sig= 1.000** | |
| **Heart Rate Category (1=Excellent,**  **5=Very Poor)** |  | | (1.06) |  | 1.75 | (1.26) | | **Wilcoxon Z**  = -4.367 (< 0.001) | |

According to Table 2, the proportion of participants classified with poor fitness did not significantly change. However, the Wilcoxon test was significant with a p-value of <0.0001), demonstrating participants improved into better heart rate categories, showing the intervention enhanced cardiovascular fitness.

**Table 3:Independent Samples t-test in Treatment vs. Control Group**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | |  |  | |
|  | **Control Mean (SD)** | **Treatment Mean (SD)** | **Leverne’s Test Value** | | **p-value** |
| **Self-Efficacy** | 2.90(0.71) | 3.56(0.92) | 11.93 | 0.001 | |
| **Value-Expectancy** | 1.70(1.00) | 1.75(1.26) | 3.54 | 0.061 | |
| **Physical Activity (mean cycles per minute)** | 500.36  (189.04) | 597.75  (251.20) | 8.90 | 0.003 | |
| **Heart Rate (beats/minute)** | 100.59  (8.89) | 95.78  (11.76) | 13.59 | 0.000 | |

Table 3 indicates that unequal variances were assumed for self-efficacy, physical activity, and heart rate. This suggests that the treatment group received the intervention positively. However, the value expectancy had a p-value greater than 0.05, indicating no significant change from the intervention.

**Table 4: Proportion Differences in Treatment vs. Control Groups**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | |  |
|  | **Control %**  **(Mean)** | **Treatment %**  **(Mean)** | **Significance Level** | |
| **Not Poor HR** | 85.8 | 89 |  |
| **Poor HR** | 14.2 | 11 |  |
| **Heart Rate Category (1=Excellent,**  **5=Very Poor)** | 2.86 |  |  |
| **Mann-Whitney U** |  |  | 8634.0 |
| **Wilcoxon W** |  |  | 19219.0 |
| **Z** |  |  | -4.060 |
| **Asymp.Sig (2-tailed)** |  |  | 0.00 |

According to Table 4, the treatment group had a higher proportion of participants with not poor HR at 89% compared to the control group's 85.8%, suggesting an improvement in heart rate classification due to the program intervention. Nonparametric tests were conducted to establish statistical significance further. With a negative Z score, the treatment group exhibited significantly lower heart rate categorical values. The magnitude of improvement is moderate, indicating a shift toward improved heart rate.

**Table 5: ANCOVA Results Comparing Treatment vs. Control**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Estimated Marginal Means** | |  |  |
|  | **Control**  **(n=155)** | **Treatment (n=145)** | **p-value** | **r2** |
| **Self-Efficacy** | 2.89 | 3.58 | <0.000 | 0.522 |
| **Value-Expectancy** | 1.70 | 1.75 | 0.585 | 0.455 |
| **Physical Activity (mean cycles per minute)** | 502.67 | 595.29 | <0.000 | 0.604 |
| **Heart Rate (beats/minute)** | 100.31 | 96.08 | <0.000 | 0.582 |

According to Table 5, self-efficacy, physical activity, and heart rate were statistically significant, indicating that the intervention had a positive impact in the treatment group. The r² values were calculated to explain the variance, with the highest value in physical activity, suggesting a strong effect.

**Table 6: Paired t-test Results for Girls and Boys in Clara Burton (n=51 for Girls, 49 for Boys)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Pretest** | | **Posttest** | | **Wilcoxon Sign Test** | | | | |
|  | **Girls Mean**  **(SD)** | **Boys Mean**  **(SD)** | **Girls Mean**  **(SD)** | **Boys Mean**  **(SD)** | **Girls**  **Z-score** | | **Boys**  **Z-score** | **Girls p-value** | **Boys p-value** |
| **Self-Efficacy** | 2.78  (0.84) | 2.82  (0.72) | 3.15  (0.97) | 3.16  (0.86) | -2.94 | -2.67 | | 0.003 | 0.008 |
| **Value-Expectancy** | 1.43  (1.11) | 1.76 (1.05) | 1.50  (1.07) | 1.73  (1.20) | -.33 | -.15 | | 0.739 | 0.88 |
| **Physical Activity (mean cycles per minute)** | 483.77  (164.15) | 502.97  (152.90) | 530.57  (228.81) | 562.95  (225.86) | -1.70 | -2.05 | | 0.09 | 0.040 |
| **Heart Rate (beats/minute)** | 97.19  (8.36) | 105.40  (8.73) | 96.56  (10.35) | 101.96  (12.06) | -0.32 | -2.52 | | 0.750 | 0.012 |

Table 6 compares pre-test and post-test means in a smaller subgroup of boys and girls in one of the three schools where the intervention occurred. The value expectancy remained insignificant in both groups, with p-values greater than 0.05. Self-efficacy significantly improved in both girls and boys. Physical activity also appeared to have increased more in boys than in girls, as it was significant, coinciding with heart rates significantly decreasing more in boys.

**Table 7: Independent Samples T-test in Girls vs Boys in Clara Burton**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | | |  | |  | | |
|  | | **Girls Mann-Whitney** | **Boys**  **Mann-Whitney** | **Girls Wilcoxon** | **Boys Wilcoxon** | | **Girls**  **Z-score** | | **Boys**  **Z-score** | **Girls p-value** | | **Boys p-value** |
| **Self-Efficacy** | | 150.00 | 164.50 | 360.00 | 464.50 | | -3.09 | | -2.71 | 0.002 | | 0.007 |
| **Value-Expectancy** | | 288.00 | 267.60 | 498.00 | 567.50 | | -.42 | | -0.65 | 0.67 | | 0.52 |
| **Physical Activity (mean cycles per minute)** | | 231.00 | 217.00 | 441.00 | 517.00 | | -1.52 | | -1.66 | 0.127 | | 0.10 |
| **Heart Rate (beats/minute)** | | 208.00 | 245.00 | 704.00 | 570.00 | | 01.97 | | -1.10 | 0.05 | | 0.27 |

Table 7 compares rates between girls and boys using the Mann-Whitney U and Wilcoxon Signed Ranks tests, along with their corresponding z and p values. Self-efficacy was statistically significant, with boys exhibiting higher self-efficacy than girls. There was no significant difference in value expectancy between girls and boys, as p-values were more critical than 0.05. Physical activity increased moderately in boys, but this was not statistically significant. However, girls significantly improved heart rates, while boys had a p-value of 0.27.