1. P=0.1249 from Wilcoxon two sample test.

| **Analysis Variable : day Days till Improvement** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **adhd** | **N Obs** | **Mean** | **Std Dev** | **Std Error** | **Minimum** | **Lower Quartile** | **Median** | **Upper Quartile** | **Maximum** |
| **No** | **72** | 15.0 | 7.9 | 0.9 | 3.0 | 9.0 | 13.0 | 18.5 | 41.0 |
| **Yes** | **69** | 20.4 | 15.2 | 1.8 | 4.0 | 11.0 | 15.0 | 26.0 | 68.0 |

1. If we divided the days till improvement into two groups (<21 vs >=21), p=0.0809(Chi-square Test).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | **Table of ADHD by long** | | | | | --- | --- | --- | --- | |  | **Short(<21 days)** | **Long(>=21 days)** | **Total** | | **No** | |  | | --- | | 60 | | 55.05 | | |  | | --- | | 12 | | 37.50 | | |  | | --- | | 72 | |  | | | **Yes** | |  | | --- | | 49 | | 44.95 | | |  | | --- | | 20 | | 62.50 | | |  | | --- | | 69 | |  | | | **Total** | |  | | --- | | 109 | | |  | | --- | | 32 | | |  | | --- | | 141 | | |

Both results from 1 and 2 tell that there is a potential significant difference between ADHD=Yes and No regarding the days to recovery (Need further study).

1. For current data set, to detect the difference between ADHD=Yes and No the power is 0.735.
2. If we want to increase the power, the sample sized need to be(suppose both groups have equal size):

| **Computed N Per Group** | | | |
| --- | --- | --- | --- |
| **Index** | **Nominal Power** | **Actual Power** | **N Per Group** |
| **1** | 0.7 | 0.707 | 66 |
| **2** | 0.8 | 0.803 | 83 |
| **3** | 0.9 | 0.900 | 110 |

P=0.84 (Kruskall Wallis Test ), which tells the days to recover was not significantly correlated to # of previous concussion.

| **Analysis Variable : day Days till Improvement** | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Previous Concussions** | **N Obs** | **Mean** | **Std Dev** | **Minimum** | **Lower Quartile** | **Median** | **Upper Quartile** | **Maximum** |
| **0** | **102** | 17.4 | 11.0 | 3.0 | 10.0 | 13.0 | 20.0 | 62.0 |
| **1** | **29** | 17.7 | 14.0 | 3.0 | 10.0 | 15.0 | 19.0 | 57.0 |
| **2** | **10** | 20.1 | 20.1 | 7.0 | 8.0 | 12.0 | 19.0 | 68.0 |

**proc** **glm** data = adhd;

class concussion adhd;

model day = concussion adhd concussion\*adhd/solution;

**run**;

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **concussion** | 2 | 19.5937407 | 9.7968703 | 0.07 | 0.9363 |
| **adhd** | 1 | 857.8829244 | 857.8829244 | 5.76 | 0.0177 |
| **concussion\*adhd** | 2 | 128.8762206 | 64.4381103 | 0.43 | 0.6495 |

For ANOVA analysis, only the ADD/ADHD(Yes/No) factor is significant, which tells ADD is highly correlated to days to recover, which #previous concussion and the interaction between # previous concussion and ADD/ADHD are not.

| **Analysis Variable : day Days till Improvement** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **adhd** | **Previous Concussions** | **N Obs** | **Mean** | **Std Dev** | **Minimum** | **Lower Quartile** | **Median** | **Upper Quartile** | **Maximum** |
| **No** | **0** | **56** | 15.3 | 8.4 | 3.0 | 9.0 | 13.0 | 19.0 | 41.0 |
|  | **1** | **12** | 14.3 | 6.5 | 3.0 | 10.0 | 14.5 | 18.0 | 27.0 |
|  | **2** | **4** | 12.8 | 4.6 | 8.0 | 10.0 | 12.0 | 15.5 | 19.0 |
| **Yes** | **0** | **46** | 19.9 | 13.1 | 4.0 | 12.0 | 14.5 | 26.0 | 62.0 |
|  | **1** | **17** | 20.1 | 17.2 | 5.0 | 7.0 | 16.0 | 19.0 | 57.0 |
|  | **2** | **6** | 25.0 | 25.3 | 7.0 | 8.0 | 11.5 | 44.0 | 68.0 |