**Decision of Statistical Analysis**

**(Comparison between 2 groups or conditions)**

Precondition to t-test

①Confirmation of Parametric: Shapiro-Wilke,Kolmogorov-Smirnov test, Anderson-Darling Nomality test

②Confirmation of Homoscedasticity:F-test

|  |  |  |
| --- | --- | --- |
|  | Paired | Unpaired |
| Parametric | Paired t-test | Unpaired t-test |
| Non-parametric | Wilcoxon signed rank test | Mann-Whitney’ U-test  Wilcoxon rank sum test |

Classification of unpaired t-test:

Same distribution→Student’s t test

Different distribution→Welch’s t test

**(Comparison over 3 groups or conditions)**

|  |  |  |
| --- | --- | --- |
|  | Repeated measures | Non-repeated measures |
| Parametric | Repeated measures ANOVA | Non-repeated measures ANOVA  One way ANOVA |
| Non-parametric | Friedman test | Kruskal Wallis test |

↓Post hoc test（multiple comparison）

|  |  |  |  |
| --- | --- | --- | --- |
|  | | After repeated measures ANOVA | After non-repeated measures ANOVA |
| parametric | Not many comparisons  (n≦5 groups) | Bonferroni correction  (Holm test, Shaffer test) | Bonferroni correction  (Holm test, Shaffer test)  Fisher’s PLSD test(LSD test):only 3 groups) |
| Vs control | Dunnett test | Dunnett test |
| Multiple comparisons |  | Tukey-Kramer test(Turkey test)  Scheffe’s test  Games-Hawell test |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | After Friedman test | After Kruskal Wallis H-test |
| Non-parametric | Multiple comparisons | Bonferroni test  (Holm test, Shaffer test) | Steel-Dwass test  Cochran Q test  Median test |
| Vs control | Dunnett test | Steel test  Shirley-Williams test |

**(Comparison between observed frequency and expected frequency)**

|  |  |  |
| --- | --- | --- |
| Regular data | There is <10 number in data | There is <4 number in data |
| Chi square test |  | |
| 2×2 Chi square test | Yates 2×2 Chi square test | Fisher exact probability |
| m×n Chi square test | Yates m×n Chi square test |  |

**(Comparison of distribution between 2 groups or conditions)**

F-test

**(Correlation and regression analysis)**

|  |  |
| --- | --- |
| Parametric | Correlation |
| Non-parametric | Spearman’s correlation |