$\chi^2 = 20.67 > \chi^2_{(0.05,1)} = 3.84$ — The drug [illegible]

LESSON 12

EX1

IT 1	IT 2	d	RANK	SIGN
116	109	7	1	+
100	89	11	4	+
110	98	12	5	+
100	110	10	3	−
124	115	9	2	+
134	110	24	9	+
128	105	23	8	+
110	90	20	6	+
100	121	21	7	−
130	105	25	10	+

Wilcoxon T test because:

- Two paired groups
- Quantitative dependent variable

ΣRi:

$T_+ = 1+4+5+2+8+9+6+10 = 45$

$T_- = 3+7 = 10$ — the smallest

$T = 10 > T_{(0.05,10)}^{\alpha,N} = 8$ — Ho

EX2

IT 1	IT 2	d	RANK	SIGN
112	131	19	10	−
116	117	1	1	−
108	90	18	9	+
100	102	2	2	−
94	99	5	4	−
125	110	15	8	+
120	106	14	7	+
112	115	3	3	−
123	131	8	6	−
115	121	6	5	−

Wilcoxon T test because:

- Two paired groups
- Quantitative dependent variable

ΣRi:

$T_+ = 9+8+7 = 24$ — the smallest

$T_- = 10+1+2+4+3+6+5 = 31$

$T = 24 > T(\alpha, N) = T(0.05, 10) = 8$ — Ho

Ex 3

TEAM SPORTS	INDIVIDUAL SPORTS	d	RANK	SIGN
125	110	15	7	+
115	122	7	3	-
130	125	5	1.5	+
140	120	20	9	+
140	140	0	0	
115	124	9	4	-
140	123	17	8	+
125	137	12	6	-
140	135	5	1.5	+
135	145	10	5	-

Wilcoxon T test because:
- 2 paired groups
- Quantitative dependant variable

$T_+ = \Sigma R_{i+} = 7 + 1.5 + 9 + 8 + 1.5 = 27$

$T_- = \Sigma R_{i-} = 3 + 4 + 6 + 5 = (18)$ — The smallest

d=0 is not considered

$T = 18 > T(\alpha, N) = T(0.05, 9) = 6$ → H_0

Ex 4

											ΣR
PRIVATE	3 (3.5)	3.2 (5)	4.8 (8)	5.5 (10)	5.8 (11)	6.5 (13.5)	7.5 (16)	8 (17)			84
PUBLIC	2 (1)	2.5 (2)	3 (3.5)	3.5 (6)	4.5 (7)	5 (9)	6 (12)	6.5 (13.5)	7 (15)	8.5 (18)	87

Mann-Whithey U because:
- 2 independent groups
- Quantitative dependent variable

$U = n_1 n_2 + \frac{n_1(n_1+1)}{2} - \Sigma R_1 = 8 \cdot 10 + \frac{8(8+1)}{2} - 84 = 80 + \frac{72}{2} - 84 = (32)$ The smallest

$U = n_1 n_2 + \frac{n_2(n_2+1)}{2} - \Sigma R_2 = 8 \cdot 10 + \frac{10(10+1)}{2} - 87 = 80 + 55 - 87 = 48$

$U(\alpha, n_2, n_1) = U(0.05, 10, 8) = 17$

$U = 32 > U(.05, 10, 8) = 17$ → H_0

Ex. 5.:

2 independent groups } → Mann - Whitney U
Assumptions not accepted)

						Σ ranks	
Healthy	4.2 (1°)	4.5 (2°)	5.1 (4°)	5.6 (6°)		13	$n_2 = 4$
Unhealthy	4.8 (3°)	5.3 (5°)	5.8 (7°)	6.1 (8°)	7.2 (9°)	32	$n_1 = 5$

$$U_1 = n_1 n_2 + \frac{n_1(n_1+1)}{2} - \Sigma R_1 = 4 \cdot 5 + \frac{4 \cdot (4+1)}{2} - 13 = 20 + 10 - 13 = 17$$

$$U_1 = n_1 n_2 + \frac{n_2(n_2+1)}{2} - \Sigma R_2 = 4 \cdot 5 + 5 \cdot \frac{(5+1)}{2} - 32 =$$

$$= 20 + \frac{5 \cdot 6}{2} - 32 = 35 - 32 = 3$$

We will chose U_1 because $U_1 < U_2$

$U_{(0,05;4,5)} = 1$ → $U_1 > U$ → H_0 accepted.

3 1

Kruskal Wallis H

6

K Groups
Independent videos
Y = quantitative

$n_1 = n_2 = n_3 = 4$
$K = 3$
$\alpha = 0'05$

$H_c (\alpha, k, n_1, n_2, n_3)$
$(0'05, 3, 4, 4, 4) = 5'692$
$(0'01, 3, 4, 4, 4) = 7'654$

A

H	Stressful	Neutral
1	2	3
6	4	5
8	9	7
10	11	12
$\Sigma R_1 = 25$	$\Sigma R_2 = 26$	$\Sigma R_3 = 27$

$$H = \frac{12}{N(N+1)} \sum_{j=1} \frac{R_j^2}{n_j} - 3(N+1)$$

$$H = \frac{12}{12(13)} \cdot \left(\frac{(25)^2}{4} + \frac{(26)^2}{4} + \frac{(27)^2}{4} \right) - 3(12+1) =$$

$$\frac{12}{156} \cdot \left(\frac{625 + 676 + 729}{4} \right) - 39$$

$$\frac{12}{156} \cdot \frac{2030}{4} - 39 = 39'04 - 39 = 0.04$$

$$\frac{24360}{624} - 39 = 0.04$$

$0.04 < 5'692$

$H < H_c$

H_0 Accepted