Answers to additional health exercises

Chapter 16 Non-parametric statistics

Chi square

Use a chi-square test for independence to compare the proportion of males and females (*gender*) that indicate that they have a sleep problem (*problem*).

gender * problem with sleep? Crosstabulation

			problem with sleep?		
			yes	no	Total
gender	female	Count	67	81	148
		% within gender	45.3%	54.7%	100.0%
		% within problem with sleep?	57.3%	53.3%	55.0%
		% of Total	24.9%	30.1%	55.0%
	male	Count	50	71	121
		% within gender	41.3%	58.7%	100.0%
		% within problem with sleep?	42.7%	46.7%	45.0%
		% of Total	18.6%	26.4%	45.0%
Total		Count	117	152	269
		% within gender	43.5%	56.5%	100.0%
		% within problem with sleep?	100.0%	100.0%	100.0%
		% of Total	43.5%	56.5%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.422[b]	1	.516		
Continuity Correction [a]	.277	1	.599		
Likelihood Ratio	.423	1	.516		
Fisher's Exact Test				.538	.300
Linear-by-Linear Association	.421	1	.517		
N of Valid Cases	269				

a. Computed only for a 2x2 table

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 52.63.

Inspection of the cross tabulation table indicates that 45.3% of females and 41.3% of males reported having a problem with their sleep. The Chi square test (using the Continuity Correction for 2X2 tables) indicates that this difference is not statistically significant (p=.599).

Mann Whitney U Test

Use the Mann Whitney U test to compare the mean sleepiness ratings (Sleepiness and Associated Sensations Scale total score : *totSAS*) for males and females (*gender*). Compare the results of this test with the parametric equivalent (t-test for independent samples, Chapter 16).

Ranks

	gender	N	Mean Rank	Sum of Ranks
sleepy & assoc sensations scale	female	144	138.71	19974.00
	male	107	108.90	11652.00
	Total	251		

Test Statistics [a]

	sleepy & assoc sensations scale
Mann-Whitney U	5874.000
Wilcoxon W	11652.000
Z	-3.219
Asymp. Sig. (2-tailed)	.001

a. Grouping Variable: gender

The results reported in the above table indicate that there is a statistically significant difference in mean sleepiness ratings for males and females (Z=-3.22, p=.001). Inspection of the mean ranks for the two groups indicate that females reported higher scores (mean rank=138.71), than males (mean rank=108.9).

This result is consistent with the results of the parametric alternative test (t-test for independent samples) conducted in the additional exercise in Chapter 16.

Kruskal-Wallis Test

Conduct a Kruskal-Wallis Test to compare the mean sleepiness ratings (Sleepiness and Associated Sensations Scale total score : *totSAS*) for the three age groups defined by the variable *agegp3* (<=37, 38-50, 51+).

Ranks

	agegp3	N	Mean Rank
sleepy & assoc sensations scale	<= 37	79	123.52
	38 - 50	79	114.62
	51+	72	107.67
	Total	230	

Test Statistics [a,b]

	sleepy & assoc sensations scale
Chi-Square	2.162
df	2
Asymp. Sig.	.339

a. Kruskal Wallis Test

b. Grouping Variable: agegp3

The results of the Kruskal-Wallis Test indicate that there is no significant difference (p=.339) in sleepiness scores across the three age groups.