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*).

			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%

gender * problem with sleep? Crosstabulation

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 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 17).

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of totsas sleepy & assoc sensations scale is the same across categories of sex sex.	Independent-Samples Mann-Whitney U Test	.001	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

Independent-Samples Mann-Whitney U Test

sleepy & assoc sensations scale across sex

Total N	251
Mann-Whitney U	5874.000
Wilcoxon W	11652.000
Test Statistic	5874.000
Standard Error	568.491
Standardized Test Statistic	-3.219
Asymptotic Sig.(2-sided test)	.001

Independent-Samples Mann-Whitney U Test Summary

Follow up test to obtain median scores for each group

Report

totsas sleepy & assoc sensations

scale

sex sex	N	Median
0 female	144	30.00
1 male	107	22.00
Total	251	27.00

The results reported in the above tables indicate that there is a statistically significant difference in median sleepiness ratings for males and females (Z=-3.22, p=.001). Females reported higher scores (MD=30), than males (MD=22).

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 sleepiness ratings (Sleepiness and Associated Sensations Scale total score : totSAS) for the three age groups defined by the variable agegp3 (<=37, 38-50, 51+).

Hypothesis Test Summary				
	Null Hypothesis	Test	Sig.	Decision
1	The distribution of totsas sleepy & assoc sensations scale is the same across categories of agegp3 agegp3.	Independent-Samples Kruskal-Wallis Test	.339	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

Independent-Samples Kruskal-Wallis Test

sleepy & assoc sensations scale across agegp3

Independent-Samples Kruskal-Wallis Test Summary

Total N	230
Test Statistic	2.162 ^{a,b}
Degree Of Freedom	2
Asymptotic Sig.(2-sided test)	.339

a. The test statistic is adjusted for ties.

b. Multiple comparisons are not performed because the overall test

does not show significant differences across samples.

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