Answers to SPSS output generation

SPSS Interpretation 3
Practice Problem

A pharmaceutical company wants to test a new pain relief drug for patients who are recovering from hip replacement surgery. The new drug comes in two dosages (10 mg and 20 mg). They randomly assign male and female patients who have undergone hip replacement surgery within the last 24 hours to one of four conditions: (1) placebo, (2) control, (3) drug A – 20 mg, and (4) drug B – 10 mg. These treatments are administered in addition to the standard treatment for hip replacement (hydrocodone every 4 hours).

After administration of the treatment every 8 hours for a 48 hour period, the following measures are taken from each participant: (1) pain relief on a 10 point scale where higher ratings indicate greater pain relief, (2) evidence of severe skin irritation in the form of itching, which is a common side effect of the medicine where 0 = no side effect and 1 = side effect is present, (3) the participant's reported ease of movement on a 5 pt scale where higher scores indicate greater movement. Finally, the researcher combines the two no treatment conditions (control and placebo) and the two treatment conditions (drug A and drug B) to create a new variable called treatment (0 = no, 1 = yes).

1. Below is the result of a Oneway ANOVA on movement for the independent variable drug, along with Tukey's post-hoc test. Write the results of this analysis in APA format including means and standard deviations, the effects of the post-hoc test, and the effect size.

Descriptives

movement

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
placebo	6	1.3333	.51640	.21082	.7914	1.8753
control	6	1.8333	.75277	.30732	1.0433	2.6233
drug A	6	4.0000	.63246	.25820	3.3363	4.6637
drug B	6	3.1667	.75277	.30732	2.3767	3.9567
Total	24	2.5833	1.24819	.25479	2.0563	3.1104

ANOVA

movement

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	26.833	3	8.944	19.877	.000
Within Groups	9.000	20	.450		
Total	35.833	23			

Multiple Comparisons

movement

Tukey HSD

		Mean Difference			95% Confidence Interval	
(I) drug	(J) drug	(I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
placebo	control	-.50000	.38730	.579	-1.5840	.5840
	drug A	-2.66667*	.38730	.000	-3.7507	-1.5826
	drug B	-1.83333*	.38730	.001	-2.9174	-.7493
control	placebo	.50000	.38730	.579	-.5840	1.5840
	drug A	-2.16667*	.38730	.000	-3.2507	-1.0826
	drug B	-1.33333*	.38730	.013	-2.4174	-.2493
drug A	placebo	2.66667*	.38730	.000	1.5826	3.7507
	control	2.16667*	.38730	.000	1.0826	3.2507
	drug B	.83333	.38730	.171	-.2507	1.9174
drug B	placebo	1.83333*	.38730	.001	.7493	2.9174
	control	1.33333*	.38730	.013	.2493	2.4174
	drug A	-.83333	.38730	.171	-1.9174	.2507

*. The mean difference is significant at the 0.05 level.

2. Below are the results of two correlations. The first was conducted to determine if pain relief was significantly related to movement. The second was conducted to determine if gender was significantly related to movement. Report the results of these analyses in APA format.

Correlations

		painrelief	movement	gender
painrelief	Pearson Correlation	1.000	.550**	-.401
	Sig. (2-tailed)		.005	.052
	N	24.000	24	24
movement	Pearson Correlation	.550**	1.000	-.068
	Sig. (2-tailed)	.005		.752
	N	24	24.000	24
gender	Pearson Correlation	-.401	-.068	1.000
	Sig. (2-tailed)	.052	.752	
	N	24	24	24.000

**. Correlation is significant at the 0.01 level (2-tailed).

3. The researcher wanted to compare the effects of the drug on pain relief for males and females separately in order to determine if the drug was effective, and if the effects interacted with gender. On the next page, we see the results of the factorial ANOVA for the factors drug and gender on the dependent measure pain relief. Write the results of the analysis in APA format including the effect sizes for the two factors and the interaction term. Don't report the means and standard deviations (refer readers to a table). Do not report the results of a post-hoc test.

Descriptive Statistics

Dependent Variable:painrelief

drug	gender	Mean	Std. Deviation	N
placebo	male	1.6667	1.52753	3
	female	.6667	1.15470	3
	Total	1.1667	1.32916	6
control	male	2.6667	1.52753	3
	female	1.3333	.57735	3
	Total	2.0000	1.26491	6
drug A	male	4.3333	1.52753	3
	female	3.3333	.57735	3
	Total	3.8333	1.16905	6
drug B	male	6.0000	1.00000	3
	female	3.3333	.57735	3
	Total	4.6667	1.63299	6
Total	male	3.6667	2.10339	12
	female	2.1667	1.40346	12
	Total	2.9167	1.90917	24

Tests of Between-Subjects Effects

Dependent Variable:painrelief

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	63.167[a]	7	9.024	6.986	.001	.753
Intercept	204.167	1	204.167	158.065	.000	.908
drug	46.833	3	15.611	12.086	.000	.694
gender	13.500	1	13.500	10.452	.005	.395
drug * gender	2.833	3	.944	.731	.548	.121
Error	20.667	16	1.292			
Total	288.000	24				
Corrected Total	83.833	23				

a. R Squared = .753 (Adjusted R Squared = .646)

4. The researcher wanted to test whether the new drug (in both doses) produced side effects (skin irritation). Skin was examined for all participants and participants were coded as having side effects (1) or no side effects (0). In addition, the researcher created a new variable that combined the control and placebo group to form a new group called "no treatment" and created another new group called "treatment" that consisted of both drug conditions. A chi-square test of independence was conducted to determine of treatment is significantly related to side effects. Below is the result of the analysis. Write the results of the test in APA format, including the effect size. Report the probability of suffering side effects given they had the treatment, compared to the probability of suffering side effects given they did not receive treatment.

treat * sideeffects Crosstabulation

			sideeffects		
			no side effects	side effects	Total
treat	no	Count	8	4	12
		Expected Count	6.0	6.0	12.0
	yes	Count	4	8	12
		Expected Count	6.0	6.0	12.0
	Total	Count	12	12	24
		Expected Count	12.0	12.0	24.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.667[a]	1	.102		
Continuity Correction[b]	1.500	1	.221		
Likelihood Ratio	2.718	1	.099		
Fisher's Exact Test				.220	.110
Linear-by-Linear Association	2.556	1	.110		
N of Valid Cases	24				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.00.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.333	.102
	Cramer's V	.333	.102
	N of Valid Cases	24