SADS-II Lab Problem-9 **03-04-2024**

A doctor has collected data on cholesterol, blood pressure, and weight from 15 patients. He also collected data on the eating habits of the subjects (e.g., how many grams of red meat, fish, and dairy products consumed per week).

S.N. of Persons	Cholesterol (milligrams)	Systolic blood pressure (millimeter)	Weight (kg)	Red meat (grams)	Fish (grams)	Dairy Products(grams)
1	190	125	67	700	350	600
2	200	120	57	600	200	700
3	203	119	59	300	150	300
4	180	124	62	450	400	400
5	207	123	69	500	600	450
6	201	115	71	650	450	550
7	199	114	73	400	300	650
8	230	130	56	450	300	700
9	225	122	70	300	450	300
10	300	121	62	250	600	400
11	170	118	58	350	700	450
12	180	117	62	400	400	600
13	250	124	72	500	300	750
14	210	128	82	650	550	300
15	150	123	74	700	650	150

To test whether there are any relationship between the three measures of health and eating habits at 5 % level of significance.

Answer:-

Hypothesis:

Null: There is no relationship b/w the three measures of health and eating habits.

Alternative: There is significant relationship b/w the three measures of health and eating habits.

1. Open SPPS
2. Enter Data in SPSS
3. Go to analyze > General Linear Model > Multivariate
4. Move Cholesterol, Systolic BP and weight to dependent variable box and rest of the variable to covariate box.
5. Click on save and select unstandardized in predicted values and residuals.
6. Select Descriptive statistics and parameter estimates in option box.

7. Click on OK

Descriptive Statistics

	Mean	Std. Deviation	N
Cholesterol_ml	206.33	35.740	15
Systolic_ml	121.53	4.502	15
Weight	66.27	7.545	15

Bartlett's Test of Sphericity[a]

Likelihood Ratio	.000
Approx. Chi-Square	42.832
df	5
Sig.	.000

Tests the null hypothesis that the residual covariance matrix is proportional to an identity matrix.

a. Design: Intercept + Red_meat_gm + Fish_gm + Dairy_gm

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.965	82.939[b]	3.000	9.000	.000
	Wilks' Lambda	.035	82.939[b]	3.000	9.000	.000
	Hotelling's Trace	27.646	82.939[b]	3.000	9.000	.000
	Roy's Largest Root	27.646	82.939[b]	3.000	9.000	.000
Red_meat_gm	Pillai's Trace	.605	4.590[b]	3.000	9.000	.033
	Wilks' Lambda	.395	4.590[b]	3.000	9.000	.033
	Hotelling's Trace	1.530	4.590[b]	3.000	9.000	.033
	Roy's Largest Root	1.530	4.590[b]	3.000	9.000	.033
Fish_gm	Pillai's Trace	.025	.078[b]	3.000	9.000	.970
	Wilks' Lambda	.975	.078[b]	3.000	9.000	.970
	Hotelling's Trace	.026	.078[b]	3.000	9.000	.970
	Roy's Largest Root	.026	.078[b]	3.000	9.000	.970
Dairy_gm	Pillai's Trace	.260	1.051[b]	3.000	9.000	.416
	Wilks' Lambda	.740	1.051[b]	3.000	9.000	.416
	Hotelling's Trace	.350	1.051[b]	3.000	9.000	.416
	Roy's Largest Root	.350	1.051[b]	3.000	9.000	.416

a. Design: Intercept + Red_meat_gm + Fish_gm + Dairy_gm

b. Exact statistic

The effect of red_meat on measure of health is significant since the significant level is 0.033 which Is not sufficient to accept null hypothesis at 5% level of significance.

The effect of fish on measure of health is not significant since the significant level is 0.970 which Is sufficient to accept null hypothesis at 5% level of significance.

The effect of dairy_product on measure of health is not significant since the significant level is 0.416 which Is sufficient to accept null hypothesis at 5% level of significance.

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Cholesterol_ml	4604.839[a]	3	1534.946	1.272	.332
	Systolic_ml	24.134[b]	3	8.045	.341	.796
	Weight	266.615[c]	3	88.872	1.843	.198
Intercept	Cholesterol_ml	18844.387	1	18844.387	15.611	.002
	Systolic_ml	5412.038	1	5412.038	229.325	.000
	Weight	1241.174	1	1241.174	25.745	.000
Red_meat_gm	Cholesterol_ml	3736.289	1	3736.289	3.095	.106
	Systolic_ml	21.705	1	21.705	.920	.358
	Weight	172.543	1	172.543	3.579	.085
Fish_gm	Cholesterol_ml	86.668	1	86.668	.072	.794
	Systolic_ml	.109	1	.109	.005	.947
	Weight	12.967	1	12.967	.269	.614
Dairy_gm	Cholesterol_ml	1103.541	1	1103.541	.914	.360
	Systolic_ml	3.080	1	3.080	.131	.725

	Weight	34.786	1	34.786	.722	.414
Error	Cholesterol_ml	13278.494	11	1207.136		
	Systolic_ml	259.599	11	23.600		
	Weight	530.318	11	48.211		
Total	Cholesterol_ml	656485.000	15			
	Systolic_ml	221839.000	15			
	Weight	66666.000	15			
Corrected Total	Cholesterol_ml	17883.333	14			
	Systolic_ml	283.733	14			
	Weight	796.933	14			

a. R Squared = .257 (Adjusted R Squared = .055)

b. R Squared = .085 (Adjusted R Squared = -.164)

c. R Squared = .335 (Adjusted R Squared = .153)

There is no significant impact on cholesterol level by eating habits since P value is 0.332 which is not sufficient to reject null hypothesis at 5% level of significance

There is no significant impact on systolic BP by eating habits since P value is 0.796 which is not sufficient to reject null hypothesis at 5% level of significance

Conclusion:-

There is no significant impact on weight by eating habits since P value is 0.198 which is not sufficient to reject null hypothesis at 5% level of significance