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EVALUATION OF THE LEISHMANIASIS IN AL-SADER MEDICAL CITY FOR FIVE VARIABLES USING SPSS PROGRAM

HADEEL SALIM ALKUTUBI[1], HASAN ALI AL-AZZAM[2] & EBTESAM NAJIM AL-BISTENCHY[1]

[1]Informatics Center for Research & Rehabilitation, Kufa University, Najaf, Iraq

[2]Al-Sader Medical City, Najaf, Iraq

ABSTRACT

The main propose of this study is to evaluate the Leishmaniasis in AL-Sader medical city in Iraq in 2012 for five variables (equations) that is (1)Presence of sand fly in the patient house, (2) Presence of rodents in the patient house, (3) Presence of dog in the patient house, (4) Any control in the patient house?, and (5) Any other patient in your family?. The data is analyzed using T-test F-test and Analysis of Variance to get the significant different between variables. SPSS program V. 17.0 was used throughout this study to analyzed the data and to generate the various Tables and Figures.

KEYWORDS: T-Test, F-Test, Analysis of Variance (ANOVA), and SPSS Program V. 17.0

INTRODUCTION

In this study, we evaluate the Leishmaniasis in AL-Sader medical city in Iraq in 2012 for five variables (equations) that is (1) Presence of sand fly in the patient house, (2) Presence of rodents in the patient house, (3) Presence of dog in the patient house, (4) Any control in the patient house?, and (5) Any other patient in your family?. The data is analyzed using T-test F-test and Analysis of Variance to get the significant different between variables.

T-tests and analysis of variance (ANOVA) are widely used statistical methods to compare group means. For example, the independent sample t-test enables you to compare annual personal income between rural and urban areas and examine the difference in the grade point average (GPA) between male and female students. Using the paired t-test, you can also compare the change in outcomes before and after a treatment is applied. For a t-test, the mean of a variable to be compared should be substantively interpretable. Technically, the left-hand side (LHS) variable to be tested should be interval or ratio scaled (continuous), whereas the right-hand side (RHS) variable should be binary (categorical). The t test can also compare the proportions of binary variables. The mean of a binary variable is the proportion or percentage of success of the variable. When sample size is large, t-tests and z-test for comparing proportions produce almost the same answer[4]

MATERIAL AND METHODS

T-Test and Analysis of Variance

The t-test can be conducted on a one sample, paired samples, and independent samples. The one sample t-test checks if the population mean is different from a hypothesized value (oftentimes zero). If you have two samples, which are not independent but paired, you need to compute differences of individual matched pairs. A typical example is outcome measurements of pre- and post- treatment. The paired t-test examines if the mean of the differences (effect of treatment) is discernable from zero (no effect). Therefore, the underlying methods of one sample t-test and paired t-test are in fact identical.If two samples are taken from different populations and their elements are not paired, the independent sample t-test compares the means of two samples.3 In a GPA data set of male and female students, for example, the GPA of the first male student is nothing to do with that of the first female student. When two samples have the same population variance,

the independent samples t-test uses the pooled variance when computing standard error.4 Otherwise, individual variances need to be used instead in computation, and degrees of freedom should be approximated. The folded F test is used to evaluate the equality of two variances. In both cases, the null hypothesis is two samples have the same mean. [4]

T-Test: Dependent Samples

Park present T-tests that is compare the means of two samples. Two variables may or may not be independent. When each element of a sample is matched to its corresponding element of the other sample, two samples are paired. This paired t-test examines the mean of individual differences of paired measurements and thus is appropriate for pre-post situations. Suppose we want to investigate the effectiveness of a new medicine on lung cancer by checking patients before and after they took the medicine.

The paired t-test is based on the pairwise differences in values of matched observations of two samples $d_i = y_{1i} - y_{2i}$ The difference of matched pairs is treated as a variable; the logic of the paired t-test and one sample t-test is identical.

$t_{\bar{d}} = \frac{\bar{d}-D_0}{S_{\bar{d}}} \sim t(n-1)$, where

$\bar{d} = \frac{\sum d_i}{n}$, $S_d{}^2 = \frac{\sum(d_i-\bar{d})^2}{n-1}$, and $S_{\bar{d}} = \frac{S_d}{\sqrt{n}}$

The null hypothesis is that the population mean of individual differences of paired observations is D0 (zero unless explicitly specified), $H_0: \mu_d = D_0$ If the null hypothesis is rejected, there must be a significant difference (effect) between two samples.

If the null hypothesis of equal variances is not rejected, the pooled variance S^2 can be used. The pooled variance consists of individual sample variances weighted by the number of observations of the two groups. The null hypothesis of the independent sample t-test is $H_0: \mu_1 - \mu_2 = D_0$ and the degrees of freedom are $n_1 + n_2 - 2 = (n_1 - 1) + (n_2 - 1)$ The t statistic is computed as follows.

$t = \frac{(\overline{y_1}-\overline{y_2})-D_0}{S\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}} \sim t(n_1 + n_2 - 2)$, where

$$S^2 = \frac{\sum (y_{1i} - \overline{y_1})^2 + \sum (y_{2j} - \overline{y_2})^2}{n_1 + n_2 - 2} = \frac{(n_1 - 1)S_1{}^2 + (n_2 - 1)S_2{}^2}{n_1 + n_2 - 2}$$

When the equal variance assumption is violated, the t-test needs to use individual variances in the approximate t and the degrees of freedom. This test may be called the unequal variance t test . Notice that the approximation below is based both on the number of observations and variances of two independent samples. The approximate t is

$t' = \frac{\overline{y_1}-\overline{y_2}-D_0}{\sqrt{\frac{S_1{}^2}{n_1}+\frac{S_2{}^2}{n_1}}} \sim t_{df}$, where

$df = \frac{(n_1-1)(n_2-1)}{(n_1-1)(1-C)^2+(n_2-1)C^2}$ and $C = \frac{\frac{S_1{}^2}{n_1}}{\frac{S_1{}^2}{n_1}+\frac{S_2{}^2}{n_2}}$

RESULTS

Table 1: Number of Injuries, Broken Down by Preventive Axis

Presence of Sand Fly in the Patient House		Presence of Rodents in the Patient House		Presence of Dog in the Patient House		Any Control in the Patient House		Any other Patient in Your Family	
Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
44	0	42	2	38	5	0	43	4	39

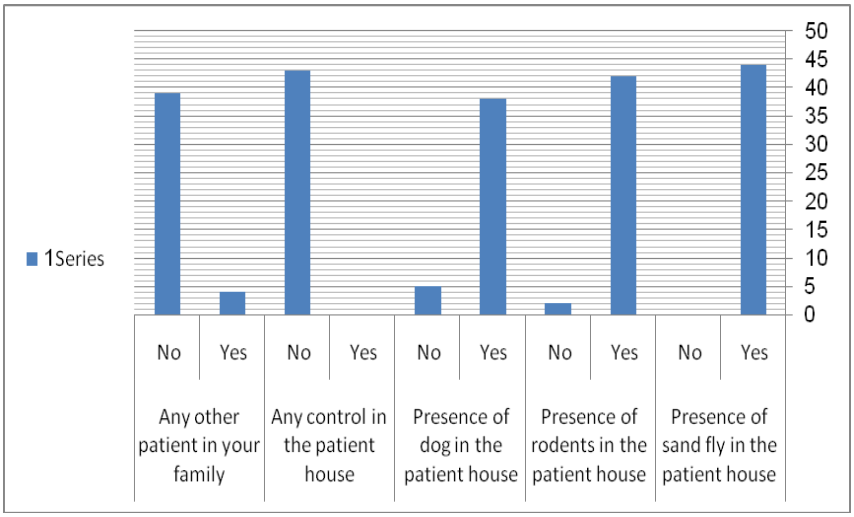

Figure 1: Number of Injuries, Broken Down by Preventive Axis

Table 2: Number of Injuries, Broken Down by Sex

Male	Female
26	18

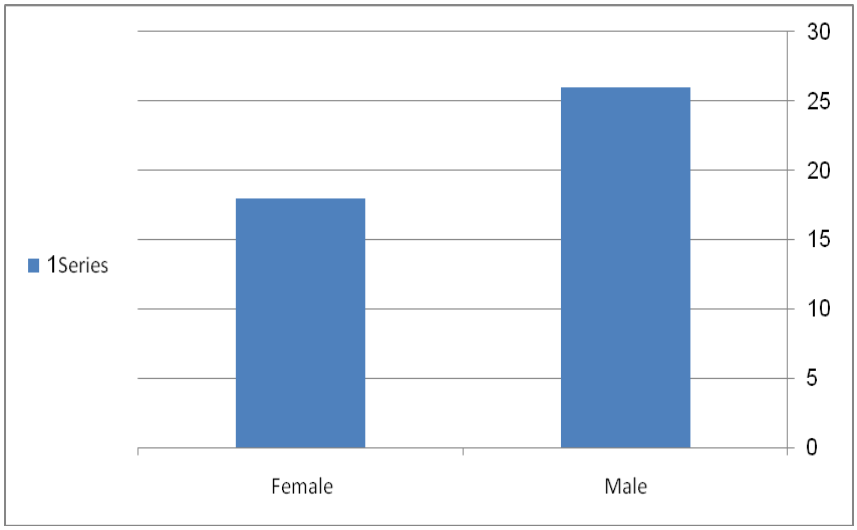

Figure 2: Number of Injuries, Broken Down by Sex

Table 3: The Number of Injuries by Age Groups

0-10	11-20	21-30	31-40	41-50	51-60	67-70	71------
12	7	11	11	3	0	0	0

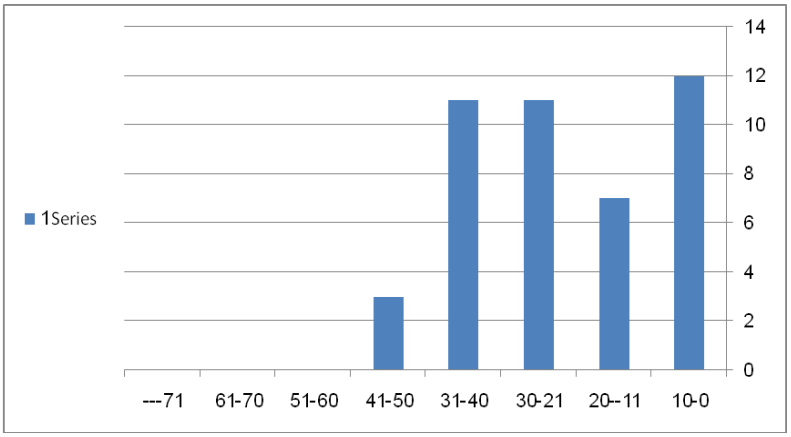

Figure 3: The Number of Injuries by Age Groups

Table 4: The Number of Injuries by Profession Injured

Wage Earner	Military	Child	Student	Housewife	Officer	Driver	Farmer
6	5	9	10	7	5	1	1

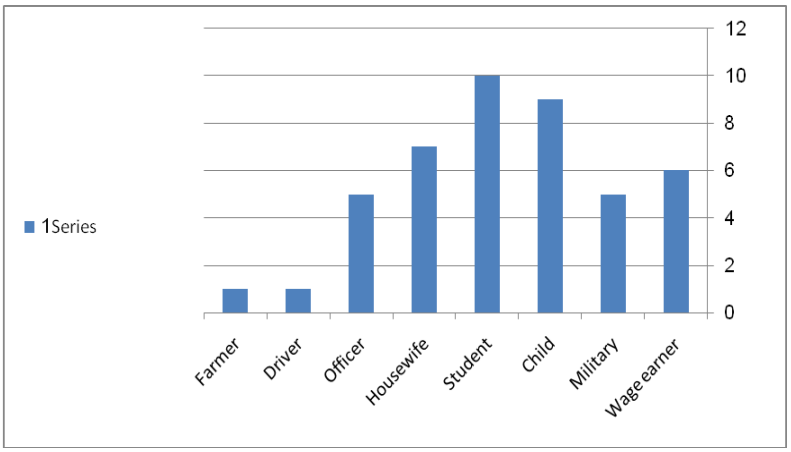

Figure 4: The Number of Injuries by Profession Injured

Table 5: The Number of Injuries by Residential Address of the Infected

Al-Najaf		Al-Kufa		Al-Qadsya		Karblaa	
Aladaala	2	Rashadya	2	Gamas	1	Alhendya	1
Alasskary	1	Mesan	2	Alshanafya	1		
Alameer	2	Alabbasea	6				
Alrahma	3	Al-iesa	1				
Almanathera	1	Almaamal	1				
Aliskan	2	Kenda	1				
Alnaser	2						
Alalamaa	1						
Alatemaa	1						
Alaruoba	1						
Alsalam	1						
Alzarraa	1						
Aljdeeda	1						
Alwfaa	1						
Alholy	1						
Alhaydarea	5						
Alqadseya	2						

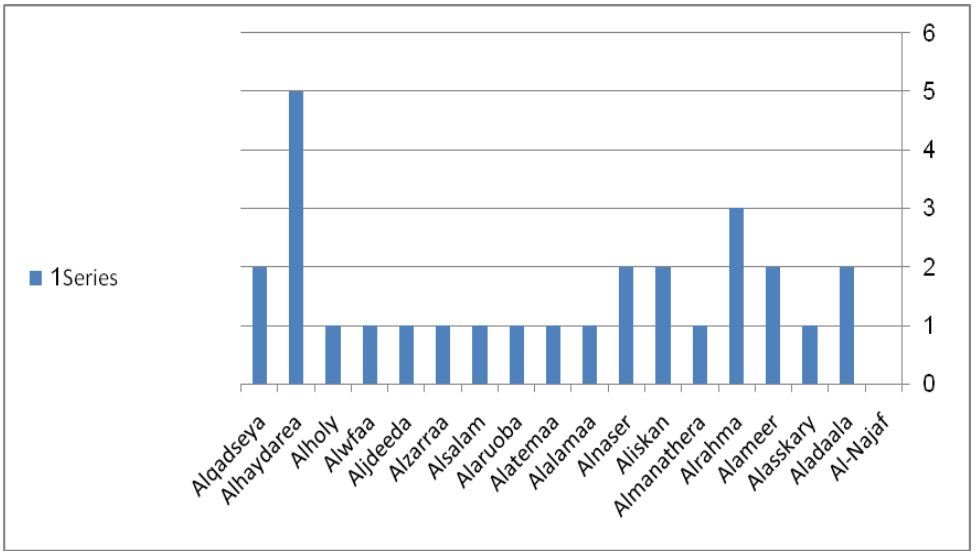

Figure 5: The Number of Injuries in A-Najaf City

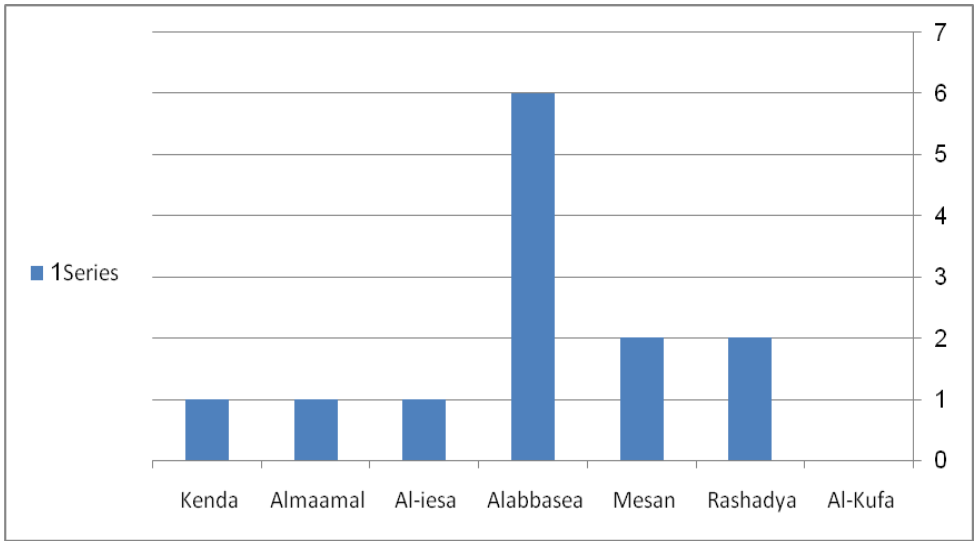

Figure 6: The Number of Injuries in AL-Kufa City

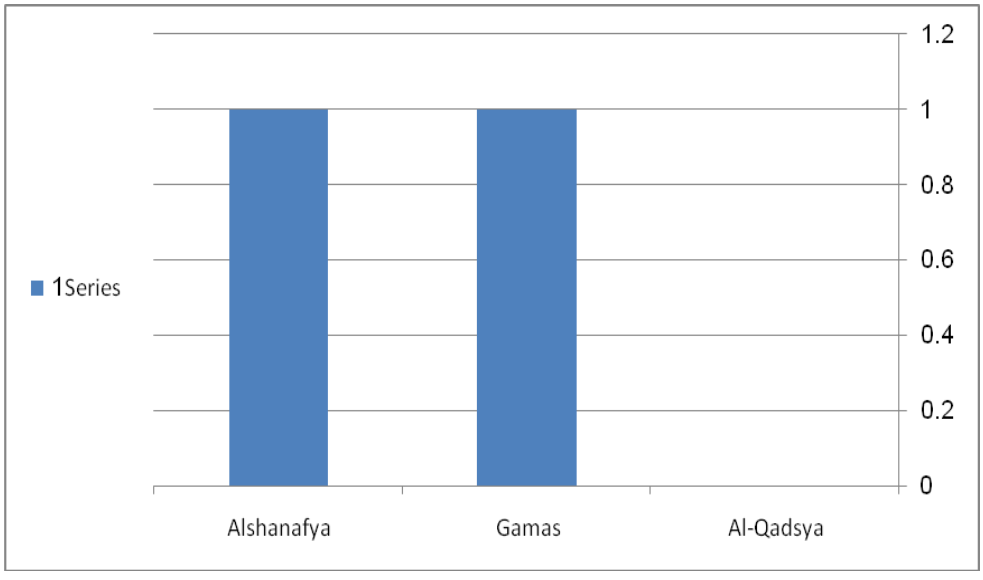

Figure 7: The Number of Injuries in AL-Qadsya City

Table 6: The Number of Injuries by Injury Symptoms

Individually	Multiple
16	28

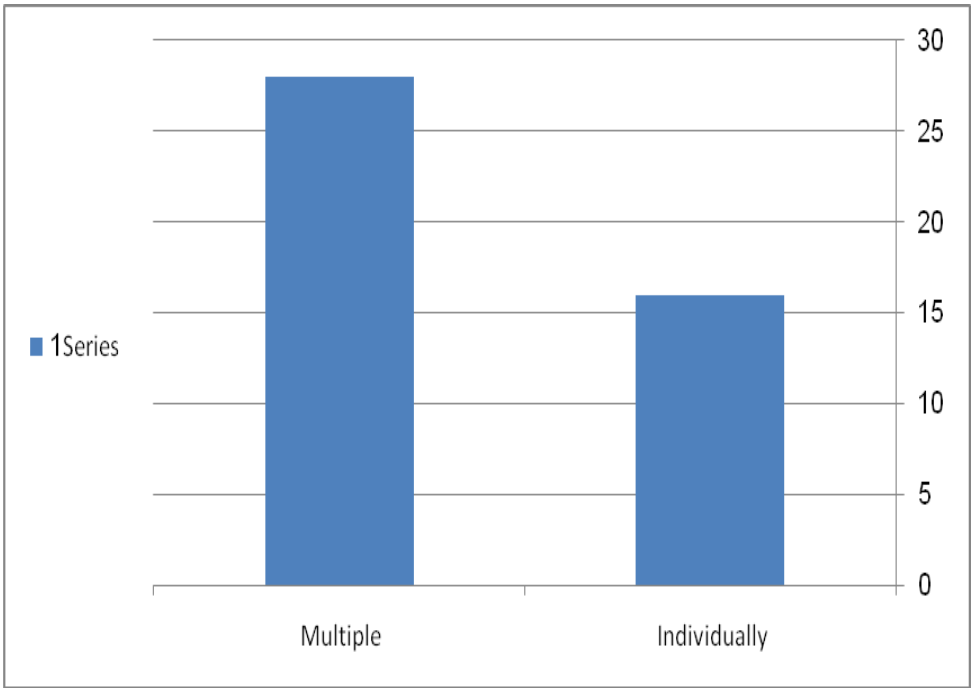

Figure 8: The Number of Injuries by Injury Symptoms

Table 7: The Number of Injuries by Location Pill

Face	Trunk	Parties
15	1	29

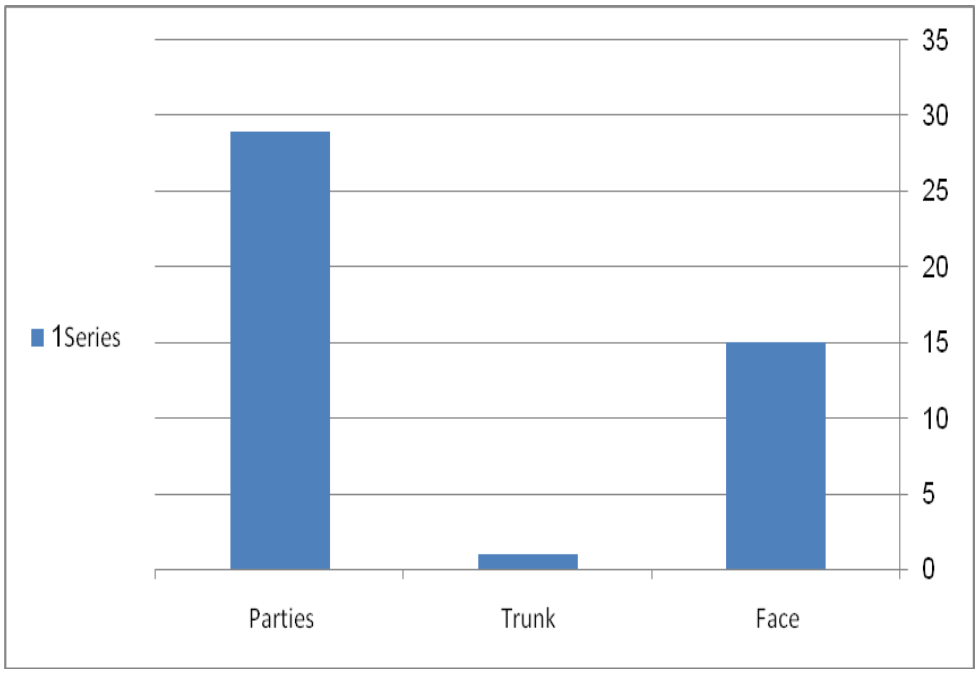

Figure 9: The Number of Injuries by Location Pill

Table 8: Analysis of Variance for Five Variables

Variables	Sours of Variation	Sum of Squares	df	Mean Square	F	Sig.
Presence of sand fly in the patient house	Between group Within group Total	0.000 0.000 0.000	1 34 35	0.000 0.000		
Presence of rodents in the patient house	Between group Within group Total	0.003 1.886 1.889	1 34 35	0.003 0.055	0.057	0.812
Presence of dog in the patient house	Between group Within group Total	0.007 2.743 2.750	1 34 35	0.007 0.081	0.089	0.768
Any control in the patient house	Between group Within group Total	0.000 0.000 0.000	1 34 35	0.000 0.000		
Any other patient in your family	Between group Within group Total	0.317 3.238 3.556	1 34 35	0.3317 0.095	3.333	0.077

Table 9: One-Sample Statistics

Variables	Mean	Std. Deviation	Std. Error Mean
Presence of sand fly in the patient house	1.0000	0.00000[a]	0.00000
Presence of rodents in the patient house	0.9444	0.23231	0.03872
Presence of dog in the patient house	0.9167	0.28031	0.04672
Any control in the patient house	0.0000	0.00000[a]	0.00000
Any other patient in your family	0.1111	0.31873	0.05312

a. t cannot be computed because the standard deviation is 0.

Table 10: One Sample Test

Variables	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Presence of rodents in the patient house	24.393	35	0.000	0.94444	o.8658	1.0230
Presence of dog in the patient house	19.621	35	0.000	0.91667	0.8218	1.0115
Any other patient in your family	2.092	35	0.044	0.11111	0.0033	0.2190

CONCLUSIONS

From Figures and Tables, we can see

- Presence of sand fly , rodents, and dog in the patient house
- There is no control in the patient house
- There is no other patient in patient family
- Numbers of injuries in male are more than numbers of injuries in female
- Number of injuries under 40 age is more than any other age groups.

- Number of injuries by location pill present number of injuries by parties more than any location.
- Number of injuries by injury symptoms present number of injuries by pill multiple more than any other injury symptoms.
- There are a significance different in three variables, that is (1)Presence of rodents in the patient house, (2)Presence of dog in the patient house, and (3)Any other patient in your family.

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