Free essay on statistical assessment

\n[toc title="Table of Contents"]\n

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Question 1

The objective of the study by Messina Daniel, Scotti Dennis, Ganey, Rodney and Zipp Pinto was to assess the relationship between patient admission and satisfaction in both teaching and non-teaching hospitals. It was to answer the questions whether patients' satisfaction differ in teaching and nonteaching hospital and how the satisfaction is influenced by admissions. Consequently, the most important statistical technique used in answering this question was Spearman correlation analysis. However, other statistical techniques that include descriptive statistics, test of normality, and hypothesis testing were employed to help in better understanding of the results.

The study established that there was a significant positive correlation between satisfaction and admissions in the sampled teaching hospitals. For nonteaching hospitals, the correlation between satisfaction and patient admission volume was negative and non-significant. Again, the study established that patients' satisfaction in both teaching and nonteaching hospital had a significant negative correlation with admissions. These three outcomes had greatest statistical significance because they provide answers

to the research questions. The outcomes imply that the satisfaction of patients tends to reduce with increasing number of hospital admissions. Consequently, hospitals should limit admission based on capacities. Establishing whether the there was a significant difference in satisfaction between the teaching and non teaching hospitals was one of the primary objectives of the study. A Mann-Whitney U-Test was used to perform a comparative analysis the satisfaction data obtained from the two samples. The mean rank for teaching hospitals patient satisfaction was 25. 76 while that of nonteaching hospital was 45. 24. The calculated z-statistic was -4. 064 at p <0. 001. Thus, the null hypothesis that the teaching versus non-teaching satisfaction scores were identical was rejected. Instead, the alternative hypothesis that teaching and nonteaching hospital had significantly different satisfaction score was upheld.

Question 2

Descriptive statistics was used in the study to analyze patient satisfaction mean scores and inpatient admissions. The mean patients' admission in the teaching hospital was 27, 745 while that of nonteaching hospital was 10, 722. These means indicate that teaching hospitals admitted almost thrice the number of patients admitted in nonteaching hospital between the years 1999 and 2003. The standard deviations for teaching and nonteaching hospitals admissions were 16, 258 and 3, 794. The standard deviations show that teaching hospital admissions were more dispersed than that of nonteaching hospitals. The combined mean for hospital admissions obtained from the results of the study was 19, 111 between 1999 and 2003 with 4, 513 as the lowest hospital admission and 70, 465 as the highest hospital

admission. The standard deviation for teaching and nonteaching hospital admission was 14, 456. Again, the standard deviations indicate that the admission data had a huge spread. A large standard deviation show large variability in data (Daly, Bourke & Bourke, 2008).

The satisfaction means score for teaching hospitals was 81. 5376 while that of nonteaching hospitals was 83. 5797. These means suggest that patients admitted in nonteaching hospitals were more satisfied than those admitted in teaching hospitals. The standard deviation for satisfaction for teaching and nonteaching were 1. 59858 and 1. 84779 respectively. The small standard deviations for both teaching and nonteaching indicate that the satisfaction data had a small variability. The overall patient satisfaction mean score was 82. 57 with 79. 05 and 86. 18 as minimum and maximum scores respectively. The combined patients' satisfaction had a small standard deviation of 2. 000. This figure is a comparatively low indicating that the data spread is small.

The mean rank for teaching hospitals patient satisfaction was 25. 76 while that of nonteaching hospital was 45. 24. U-statistic was evaluated for significance by transforming it to z-statistic because the research population was 35. Consequently, critical values could not be obtained from U-tables. The calculated z-statistic was -4. 064 at p <0. 001. Thus, the null hypothesis that the teaching versus non-teaching satisfaction scores were identical was rejected. Instead, the alternative hypothesis that teaching and nonteaching hospital had significantly different satisfaction score was upheld.

The frequency distribution of satisfaction and admission data was analysed by the use of kurtosis and skewness. These two statistical descriptors

measure the extent of deviation from normality (Westfall & Henning, 2013). A data with skewness equal to or greater than positive two or less than or equal to negative two is considered to lack normality. On the other hand, kurtosis equal to or greater than positive three is deemed to be different from the normal distribution. Consequently, the data is prone to outliers. According to Messina et al (2009), the skewness and kurtosis analysis of the hospital admissions data showed that the data was not normally distributed. On the contrary, patients' satisfaction scores had no remarkable difference from the normal distribution. The values of both skewness and kurtosis were not provided in the paper.

The Spearman correlation coefficient between patient satisfaction and teaching hospital was found to be 0. 581. This correlation coefficient of plus or minus five is considered strong (Weinberg & Abramowitz, 2008). The coefficient was also significant and implied that in teaching hospitals, the satisfaction rises with the increase in admission volumes. On the contrary, the research established that a negative correction coefficient of -0. 097 existed between satisfaction of patients in nonteaching hospitals and admission volumes. The combined sample correlation coefficient between patient satisfaction and admission was -0. 287 at p= 0. 018. The figure shows that the low satisfaction is associated with high admissions volumes.

Question 3

Statistical significance is widely used in research to predict the difference or relationship between variables. The detection of the difference between samples and groups increases with the increase in sample size. Meaning, the smaller the sample, the lesser the chances of detecting difference. For

instance, a clinical researcher using 51 subjects has a 2% probability of detecting difference. To have a 50% probability of detecting the difference needs 580 subjects. However, studies with a large number of participants can also detect irrelevant differences. So, in clinical trials, the ultimate challenge is coming up with appropriate sample size that offers a high probability of detecting differences in experimental group and control group using statistical significance tests. Once, the analysis is completed, the researcher may reject or upheld the hypothesis based on the results. In the case of clinical trial, a researcher can conclude that a dug is efficacious because of detected difference among groups.

The use of statistical significance in research has attracted criticism because it lacks decision-making value. Some people see the probabilities as numbers with little importance in life. They contend that statistical significance test may not bring out the differences for small samples. Instead, they prefer the pragmatic usefulness of the research. Pragmatic usefulness means practical importance. In the context of healthcare research, pragmatic usefulness also encompasses clinical relevance. For instance, people may be interested in knowing the therapeutic margin of the tested drugs, drug contents, target population and labelling. These elements have practical impacts on healthcare practice. For instance, based therapeutic margin, countries can recommend effective drugs of treating disease.

References

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