**QUM2 Task 1: Linear Regression Analysis**

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QUM2 Task 1: Linear Regression Analysis

**Introduction**

Task 1 a Linear Regression Analysis for a major healthcare system implemented an employee well-being program. The program was designed to improve morale and stress reduction especially for nurses. The purpose of the Linear Regression Analysis was to determine if there is a relationship between monthly rate of nurse participation in the well-being program and the nurse attrition rate over the span of 36 months. The analysis will be used as part of its routine funding plan for the next five years for management consideration.

1. **Business question for linear regression analysis.**

Is there a significant relationship between (x) Program Participation Rate and (y) Nurse Attrition Rate over the 36 months?

1. **Description of the data.**
2. Describe the relevant data characteristics for **linear regression analysis**:

•   the independent variable (x) which is the Program Participation Rate,

•   the dependent variable (y) Nurse Attrition Rate over the 36 months,

•   type of data - data from Human Resources rates on Program Participation Rates and on

Nurse Attrition Rates used for level of measurement,

•   quantity of data – there is 36 observations good quantity of data since it is more than 30+ in data sample.

1. Create a graphical display: (see Excel spreadsheet)

•   chart title

•   legend

•   axis titles

•   data intervals

1. **Report Analysis.**

(1)  Provide the output and calculations of the linear regression analysis you performed.

(see Excel Spreadsheet)

1. Justification for linear regression analysis.

I used linear regression analysis for description of the relationships between a (x) independent variable and (y) the dependent variable. Therefore, with regression analysis I will produce a regression equation where the coefficients represent the relationship between each independent variable and the dependent variable. I can use the equation to make predictions for management data decision making.

1. **Implications of data analysis.**
2. ***Statement for the null hypothesis for linear regression analysis****.*

“**Null Hypothesis**: There is no significant relationship between Program Participation Rate (x) and Nurse Attrition Rate (y).”

“**Alternative Hypothesis**: There is a significant relationship between Program Participation Rate (x) and Nurse Attrition Rate (y).”

1. ***Interpret the results****.*
2. **Goodness of fit** with the test statistic from linear regression analysis output.

R-square which determines “Goodness of Fit” of 0.5466 based on R-square being

between zero (no fit) and 1 (perfect fit) a value approximately 0.50 to 0.70 for R-square

would have been a moderate fit in linear analysis output.

1. Discussion of **independent variable (x).**

In regression analysis multiple variable quantities are relationship to each other.

Dependent variable (y) depends on other variables such as (x) for estimation or activity.

Likewise, independent variable (x) will influence the dependent variable. In linear

regression a strong linear relationship indicates that the data will bunch around in a

straight line, in a weak correlation does not. In positive linear regression the variable increase together. Likewise, in a negative linear regression one variable decrease while other variable increases in scope.

The regression is statistically significant based on a low P-value of **2.59891E-07** which can be used in the equation for further predictions. The P-value determines the significance which is less than 0.05. Since P-value is less than 0.05 which is a significant result (the null is rejected).

1. **Linear regression equation.**

Y = mx + b which in this linear regression analysis is **y = -0.0891x + 5.8342** can be used since the relationship is significant. **Null hypothesis** is rejected since there is a significant relationship between Program Participation Rate (x) and the Nurse Attrition Rate (y). This equation can be used to forecast in determining (y) the Nurse Attrition Rate in a hospital to (x) Program Participation Rate by nurses in the well-being program.

1. ***Limitations of research****.*

I have taken into consideration variables for linear regression analysis the relationship between Program Participation Rate and Nurse Attrition Rate. Further considerations for limitations in research did not factor in the element of risk or bias of the data nor future implications that may influence the data in consideration. Examples of future implications for limitations of research would be the following: 1) staff shortage limitations, 2) due to Covid overcrowding hospital conditions, 3) employee grievances unresolved, and 4) relationship contract between union representatives and management. Such limitation could affect the recommended course of action.

1. ***Recommended course of action***.

Recommendation for continuance of hospital employee well-being program participation by nurses’ attributes to improvements in employee morale reducing stress; thus, reducing nurse attrition rate over the span of 36 months. The well-being program should be promoted to employees, especially nurses. The linear regression analysis should be used as part of its routine funding plan decision- making for the next five years for management consideration.