INFS 608 Applied Statistics

Minitab Project 1

National Health Care Association

The National Health Care Association is concerned about the shortage of nurses the health care profession is projecting for the future. To determine the current degree of job satisfaction among nurses, the association sponsored a study of hospital nurses throughout the country. As part of this study, 50 nurses in a sample indicated their degree of satisfaction with their work, their pay, and their opportunities for promotion. Each of the three aspects of satisfaction was measured on a scale from 0 to 100, with larger values indicating higher degrees of satisfaction. The data collected also showed the type of hospital employing the nurses. The types of hospitals were Private, Veterans Administration (VA) and University. A portion of the data is show below. The complete data set can be found on D2L as an accompanying file called HEALTH.MTW.

*Data Sample*:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Nurse ID | Hospital | Work | Pay | Promote |
| 1 | Private | 74 | 47 | 63 |
| 2 | VA | 72 | 76 | 37 |
| 3 | University | 75 | 53 | 92 |
| 4 | Private | 89 | 66 | 62 |
| 5 | University | 69 | 47 | 16 |
| 6 | Private | 85 | 56 | 64 |
| 7 | University | 89 | 80 | 64 |
| 8 | Private | 88 | 36 | 47 |
| 9 | University | 88 | 55 | 52 |
| 10 | Private | 84 | 42 | 66 |
| … | … | … | … | … |

*Assignment*:

Use methods of descriptive statistics and histograms to summarize the data. Present a summary that will be beneficial in communicating the results to others. Discuss your findings in a written summary report. Specifically comment on the following questions:

1. On the basis of the entire data set and the three job satisfaction variables, what aspect of the job is most satisfying to the nurses? What appears to be the least satisfying? In what area(s), if any, do you feel improvements should be made? Discuss.
2. On the basis of descriptive measures of variability, what measure of job satisfaction appears to generate the greatest difference of opinion among the nurses? Explain.
3. What can be learned about the types of hospitals? Does any particular type of hospital seem to have better levels of job satisfaction then other types? Do your results suggest any recommendations for learning about and improving job satisfaction? Discuss.
4. Use additional descriptive statistic(s) to gain insights into and possibly improve job satisfaction? Explain your results.

*Additional Instructions*

1) Use Minitab software to generate the descriptive statistics used in your analysis. The goal of this assignment is for you to demonstrate your understanding of descriptive statistics and histograms. The file containing the problem data is available to you on D2L. For part 3) above, you will need to make use of the By Variables feature of the Descriptive Statistics and Histogram tools in Minitab to compute descriptive statistics and histograms for each type of hospital (VA, University, and Private).

2) Prepare a report using headings and subheadings that reflect the four exercises you are asked to analyze. The goal of this exercise is for you to demonstrate your knowledge and understanding of the material presented in Chapters 1 – 3. Therefore, your score will be adjusted upward the better you explain and justify your decisions as to which of the ten measures of central location and variation to incorporate. Your score will also reflect the skill that is demonstrated by your use of the various presentation tools for analyzing the distribution of the data (frequency distribution table, histogram, etc.). Minitab use is not just about ‘taking what you get’ from the program, it is about using Minitab to best support your claims and analysis.

3) You may assume the audience for your report will be your boss/supervisor who holds an advanced business degree but is not an expert in statistics. Do not assume that because the instructor is knowledgeable about statistics that the reader of your report is a statistics expert.

4) Prepare a report using headings and subheadings that reflect the four exercises you are asked to analyze. I expect you to use both tabular output and graphics for each of the four exercises. Begin with a brief description of the problem in your own words. Your report must be submitted as a single document using an appropriate cover sheet, one-inch margins, with pages numbered consecutively at the bottom (the cover sheet should not be numbered), and consistent font sizes. You should copy-and-paste all Minitab output-- tabular and/or graphical--that is relevant to your analysis, from Minitab into your document and format appropriately. (Use a common word processor document format even if you are not using a common word processor program: PDF (.pdf), Word (.doc or docx) or WordPerfect (.wpf) format is preferred; Rich Text Format (.rtf) is acceptable.)

5) This assignment is worth 50 points and is expected to be completed independently. (You may of course seek the assistance of the instructor.) Your comments and observations will be considered equally as important as your proper use of the statistical software. 20 points will be based on your Minitab output, 15 points on your analyses, and the remaining 15 points based on organization, presentation, and formatting. Any project submitted after the due date and time will be assessed a 5-point penalty if submitted within 24 hours after the due date. An additional 5 points will be deducted for each subsequent 24-hour day that passes until submission. A grading rubric document is included on pages 3 and 4 below.

6) Your work should be submitted via D2L. E-mailing me a file is only acceptable on an emergency basis, e.g. D2L is not functioning and you are up against the deadline.

Due: **Monday, Sept. 24, by 11:59 pm CST**

Minitab Project 1 Grading Rubric

Student: First Name/Last Name

Project Score: **xx**

Yellow highlighted elements indicate that this area could have been developed further.   
Blue highlighted elements indicate that this area met expectations in the report.

Minitab Usage Score (15 Points): **xx**

**Compute Descriptive Statistics** based on **Whole Sample data** for each of the Variables: Work, Pay and Promotion (3 points possible)

* Must include measures of Central Tendency and Variability
* Best answers will include at least two measures of Central Tendency and two measures of Variability for comparison.

**Compute Descriptive Statistics by Hospital Type** (VA, Private, University) for each the Variables: Work, Pay, and Promotion (3 points possible)

* Must include measures of Central Tendency and Variability
* Best answers will include at least two measures of Central Tendency and two measures of Variability for comparison.

**Compute three Histograms** based on **Whole Sample data** for each of the Variables: Work, Pay, and Promotion (3 points possible)

* Must follow all of the standards for the creation of histograms as taught in class

**Compute nine Histograms by Hospital Type** for each of the Variables: Work, Pay, and Promotion (3 points possible) **(9 graphs**)

* Must follow all of the standards for the creation of histograms as taught in class

**Additional Graphical or Descriptive Measures** in Question 4 (**3 Points**)   
  
  
Presentation Score (15 points possible): **xx**

**Consistent, professional report style and format** – APA or MLA. (**5 points**)

**Use of proper English spelling, capitalization, grammar, and punctuation** (**5 points**)

**Tables and Graphs are properly formatted, labeled, and easily readable** (**5 points**)

Analysis Score (20 points possible): **xx**

**Demonstrate a basic understanding of the** **use and interpretation of descriptive statistics** in the context of the assignment (5 points possible)

* Define and/or use descriptive statistics appropriately
* Associate higher central tendency with increased satisfaction
* Associate higher variability with greater difference of opinion
* Include and discuss multiple measures of central tendency and variability

**Support all conclusions using references to reported statistics and graphs**   
(5 points possible)

* Refer back to specific values of the descriptive statistics
* Make comparisons between different measures of central tendency to determine the best measure
* Make comparisons between different measures of variability to determine the best measure
* Avoid making errors that misstate the values or the interpretation of the descriptive statistics
* Discuss the shape of the distribution based upon the histograms

**Provide correct answers and discussion to support answers** for each of the following questions: (10 points possible)

* What aspect of the job is most satisfying to the nurses? +1
* What aspect or aspects of the job appears to be the least satisfying? +1
* In what area(s), if any, do you feel improvements should be made? +1
* What measure of job satisfaction appears to generate the greatest difference of opinion among the nurses? +2
* Does any particular type of hospital seem to have better levels of job satisfaction then other types? +3
* Do your results suggest any recommendations for learning about and improving job satisfaction? +1
* Additional Statistics and Analysis selected for inclusion? +1  
  Scatterplots, Skewness, etc.