

Answer Guidelines for Questions to Be Graded

Identifying Levels of Measurement: Nominal, Ordinal, Interval, and Ratio

EXERCISE

1

The questions are in bold followed by answers.

- 1. In Table 1, identify the level of measurement for the current therapy variable. Provide a rationale for your answer.**

Answer: The current therapy variable was measured at the nominal level. These drug categories were probably developed to be exhaustive for this study and included the categories of drugs the subjects were receiving. However, the categories are not exclusive, since patients are usually on more than one category of these drugs to manage their health problems. The current therapies are not measured at the ordinal level because they cannot be rank ordered, since no drug category can be considered more or less beneficial than another drug category (see Figure 1-1; Grove & Gray, 2019).

- 2. What is the mode for the current therapy variable in this study? Provide a rationale for your answer.**

Answer: The mode for current therapy was β blocker. A total of 100 (94%) of the cardiac patients were receiving this category of drug, which was the most common prescribed drug for this sample.

- 3. What statistics were conducted to describe the BMI of the cardiac patients in this sample? Discuss whether these analysis techniques were appropriate or inappropriate.**

Answer: BMI was described with a mean and standard deviation (*SD*). BMI measurement resulted in ratio-level data with continuous values and an absolute zero (Stone & Frazier, 2017). Ratio-level data should be analyzed with parametric statistics such as the mean and *SD* (Grove & Gray, 2017; Knapp, 2017).

- 4. Researchers used the following item to measure registered nurses' (RNs) income in a study:**

What category identifies your current income as an RN?

- Less than \$50,000
- \$50,000 to 59,999
- \$60,000 to 69,999
- \$70,000 to 80,000
- \$80,000 or greater

What level of measurement is this income variable? Does the income variable follow the rules outlined in Figure 1-1? Provide a rationale for your answer.

Answer: In this example, the income variable is measured at the ordinal level. The income categories are exhaustive, ranging from less than \$50,000 to greater than \$80,000. The two open-ended

categories ensure that all salary levels are covered. The categories are not exclusive, since categories (d) and (e) include an \$80,000 salary, so study participants making \$80,000 might mark either (d) or (e) or both categories, resulting in erroneous data. Category (e) could be changed to greater than \$80,000, making the categories exclusive. The categories can be rank ordered from the lowest salary to the highest salary, which is consistent with ordinal data (Grove & Gray, 2019; Waltz et al., 2017).

5. What level of measurement is the CDS score? Provide a rationale for your answer.

Answer: The CDS score is at the interval level of measurement. The CDS is a 26-item Likert scale developed to measure depression in cardiac patients. Study participants rated their symptoms on a scale of 1 to 7, with higher numbers indicating increased severity in the depression symptoms. The total scores for each subject obtained from this multi-item scale are considered to be at the interval level of measurement (Gray et al., 2017; Waltz et al., 2017).

6. Were nonparametric or parametric analysis techniques used to analyze the CDS scores for the cardiac patients in this study? Provide a rationale for your answer.

Answer: Parametric statistics, such as mean and *SD*, were conducted to describe CDS scores for study participants (see Table 1). CDS scores are interval-level data as indicated in Questions 5, so parametric statistics are appropriate for this level of data (Gray et al., 2017; Kim & Mallory, 2017).

7. Is the prevalence of depression linked to the NYHA class? Discuss the clinical importance of this result.

Answer: The study narrative indicated that the prevalence of depression increased with the greater NYHA class. In NYHA class III, 64% of the subjects were depressed, whereas 11% of the subjects were depressed in NYHA class I. Thus, as the NYHA class increased, the number of subjects with depression increased. This is an expected finding because as the NYHA class increases, cardiac patients have more severe physical symptoms, which usually result in emotional distress, such as depression. Nurses need to actively assess cardiac patients for depression, especially those in higher NYHA classes, so they might be diagnosed and treated as needed.

8. What frequency and percent of cardiac patients in this study were not being treated with an antidepressant? Show your calculations and round your answer to the nearest whole percent (%).

Answer: A total of 106 cardiac patients participated in this study. The sample included 15 patients who were receiving an antidepressant (see Table 1). The number of cardiac patients not treated for depression was 91 ($106 - 15 = 91$). The group percent is calculated by the following formula: $(\text{group frequency} \div \text{total sample size}) \times 100\%$. For this study, $(91 \text{ patients} \div 106 \text{ sample size}) \times 100\% = 0.858 \times 100\% = 85.8\% = 86\%$. The final answer is rounded to the nearest whole percent as directed in the question. You could have also subtracted the 14% of patients treated with antidepressants from 100% and obtained the 86% who were not treated with an antidepressant.

9. What was the purpose of the 6-minute walk test (6MWT)? Would the 6MWT be useful in clinical practice?

Answer: Ha et al. (2018) stated, "The 6-min walk test (6MWT) is a measure of the submaximal, steady-state functional capacity" of cardiac patients. This test would be a quick, easy way to determine a cardiac patient's functional status in a clinical setting. This functional status score could be used to determine the treatment plan to promote or maintain functional status of cardiac patients.

10. How was exercise confidence measured in this study? What was the level of measurement for the exercise confidence variable in this study? Provide a rationale for your answer.

Answer: Exercise confidence of the patients with heart failure (HF) in this study was measured with the Exercise Confidence Scale that included four subscales focused on walking, climbing, lifting objects of graded weight, and running (see the study narrative). This was a rating scale with values ranging from 0 to 100. The patients' scores for the Total Exercise Confidence scale and the subscales were considered interval-level data and analyzed with parametric statistics, such as means and *SDs* (see the study narrative; Waltz et al., 2017).