*Review Questions from Prerequisite Material*

*Instructions:* Highlight the correct answer, save as a Word document, and submit this file to the Assignment 1 Dropbox on D2L.

1. Statistical skills can play an important role in nursing because they help nurses to:

a. Calculate appropriate doses and clinical measurements

b. Generate clinical questions

c. Evaluate and generate research evidence for nursing practice

d. Make better use of computers and the Internet

2. An example of a variable is:

a. Systolic blood pressure

b. Pi (π)

c. 52.5 kilograms

d. Number of seconds in a minute

3. Which of the following is *not* a component of a research question?

a. An independent variable

b. A population

c. A sample

d. A dependent variable

4. Identify the dependent variable in the following: In elderly men, what is the effect of
 chronic fatigue on level of depression?

a. Age

b. Sex

c. Chronic fatigue

d. Depression

5. Which of the following is a continuous (vs. discrete) variable?

a. Number of pages in a book

b. Age at death

c. Falls during hospitalization

d. Number of times married

6. The measurement level that classifies attributes, indicates magnitude, and has equal
 intervals between values, but does not have a rational zero, is:

a. Nominal

b. Ordinal

c. Interval

d. Ratio

7. The measurement level that is sometimes called *categorical* or *qualitative* is:

a. Nominal

b. Ordinal

c. Interval

d. Ratio

8. It is not meaningful to calculate an arithmetic average with data from which of the
 following?

a. Nominal measures

b. Ordinal measures

c. Nominal and ordinal measures

d. All measures can be meaningfully averaged.

9. Degree of pain measured as *none, a little*, or *a lot* is measured on which of the following
 scales?

a. Nominal

b. Ordinal

c. Interval

d. Ratio

10. Body temperature is measured on which of the following scales?

a. Nominal

b. Ordinal

c. Interval

d. Ratio

11. Type of birth (vaginal or cesarean) is measured on the:

a. Nominal scale

b. Ordinal scale

c. Interval scale

d. Ratio scale

12. Which of the following is a ratio-level measure?

a. Dietary cholesterol intake (mg)

b. Cognitive impairment on a 50-item scale

c. Pain on a 10-point scale

d. Military rank

13. Ratio-level measures are different than any other level by virtue of which property?

a. Classification

b. Equal intervals between values

c. A true, rational zero

d. Indication of magnitude

14. Researchers typically collect data from a \_\_\_\_\_\_\_\_ and hope to generalize their results
 to a \_\_\_\_\_\_\_\_\_\_\_\_\_. (Fill in the blanks.)

a. Population, sample

b. Statistic, parameter

c. Sample, statistic

d. Sample, population

15. If the average amount of sleep for all people in the United States was 7.6 hours per night,
 this average would be a \_\_\_\_\_\_\_\_\_ of the population of U.S. residents. (Fill in the
 blank.)

a. Variable

b. Parameter

c. Statistic

d. Datum

16. If a nurse researcher measured the anxiety level of 100 hospitalized children, the
 children’s average score on an anxiety scale would be a:

a. Variable

b. Parameter

c. Statistic

d. Operational definition

17. Statistical methods that are used to draw conclusions about a population are called:

a. Inferential statistics

b. Descriptive statistics

c. Univariate statistics

d. Multivariate statistics

18. Which of the following variables is most likely to be negatively skewed in a general
 population?

a. Number of times arrested

b. Age at retirement

c. Number of times married

d. Age at birth

19. A normal distribution is *not:*

a. Skewed

b. Leptokurtic

c. Platykurtic

d. All of the above

The next eight questions pertain to the following table (Table 2):

**Table 2**

|  |  |  |  |
| --- | --- | --- | --- |
| Number of Pregnancies of Study Participants | Frequency | Percentage | Cumulative Percentage |
| 0 | 24 | 11.1 | 11.1 |
| 1 | 29 | 13.5 | 24.6 |
| 2 | 78 | 36.3 | 60.9 |
| 3 | 46 | 21.4 | 82.3 |
| 4 | 22 | 10.2 | 92.5 |
| 5 | 11 | 5.1 | 97.6 |
| 6 | 4 | 1.9 | 99.5 |
| 7 | 1 | 0.4 | 100.0 |
| Total | 215 | 100.0 |  |

20. In Table 2, the variable is \_\_\_\_\_\_\_ and the measurement level is \_\_\_\_\_\_\_\_\_. (Fill in
 the blanks.)

a. Discrete, interval

b. Discrete, ratio

c. Continuous, interval

d. Continuous, ratio

21. In Table 2, the value of *n* is:

a. 24

b. 100.0

c. 215

d. 7

22. In Table 2, the cumulative relative frequency for five or fewer pregnancies is:

a. 210

b. 199

c. 92.5

d. 97.6

23. The best way to graph information in Table 2 would be to construct:

a. A histogram

b. A pie chart

c. A bar graph

d. Either a pie chart or a bar graph

24. In Table 2, the distribution of data would be described as:

a. Symmetric

b. Positively skewed

c. Negatively skewed

d. It cannot be determined.

25. In Table 2, the distribution of data would be described as:

a. Unimodal

b. Bimodal

c. Multimodal

d. It cannot be determined.

26. In Table 2, the most likely number to be an outlier is:

a. 0

b. 1

c. 7

d. 24

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27. Central tendency indexes are all of the following *except* which of the following
 statements?

a. They are descriptive statistics.

b. They summarize how dispersed a set of scores is.

c. They provide information about a value around which scores cluster.

d. They are appropriate for interval- and ratio-level measures.

28. In the following distribution (10 11 12 13 14 15 15 15 15) the mode is:

a. 11

b. 12

c. 14

d. 15

29. In the following distribution (10 11 12 13 14 15 15 15 15) the median is:

a. 11

b. 12

c. 14

d. 15

30. The median is all of the following *except*:

a. The 50th percentile

b. The point that divides a distribution in half

c. *Q*2

d. The most popular score in the distribution

31. In which type of distribution is the mean a higher value than the median or mode?

a. A leptokurtic distribution

b. A positively skewed distribution

c. A negatively skewed distribution

d. A normal distribution

32. If there are outliers at either end of a distribution that is symmetric, a researcher might:

a. Calculate a trimmed mean

b. Report the median rather than the mean

c. Report the mode rather than the mean

d. Omit the variable from further analyses

33. Which of the following indexes of dispersion is *not* in the original units of measurement
 of the variable?

a. Range

b. Interquartile range

c. Standard deviation

d. Variance

34. Which of the following indexes involves the calculation of deviation scores (*x*)?

a. Range

b. *IQR*

c. *SD (standard deviation)*

d. *Median*

35. Which of the following indexes involves the calculation of percentiles?

a. *z*

b. *IQR*

c. *SD*

d. *Mean*

36. What percentage of cases for a normally distributed variable lies within 1 *SD* above and
 below the mean?

a. 34%

b. 50%

c. 68%

d. 95%

37. In calculating standard scores (z-scores), which two descriptive statistics are needed?

a. Median, *IQR*

b. Median, percentiles

c. Mean, Range

d. Mean, *SD*

38. A *z* score of 0.00 corresponds to an original score that:

a. Could not be used in the calculation of the mean

b. Is the same as the mean in the original distribution

c. Is the lowest score in the original distribution

d. Is an outlier

39. A *z* score of -1.00 corresponds approximately to a score for a normally distributed
 variable that is at the:

a. 1st percentile

b. 10th percentile

c. 16th percentile

d. 84th percentile

Questions 40 through 43 pertain to the following table (Table 3):

 **Table 3**

**Characteristics of Chemotherapy Patients (*N* =100)**

|  |  |  |
| --- | --- | --- |
| **Characteristic** | ***Mean (SD)*** | ***Median*** |
| Age (years) | 48.9 (9.8) | 47.0 |
| Body mass index (BMI) (kg/m2) | 27.0 (6.0) | 25.1 |
| Number of positive nodes | 3.4 (2.9) | 2.0 |
| Dose of cyclophosphamide (mg) | 1063.0 (477.0) | 1250.0 |
| Dose of doxorubicin (mg) | 125.0 (53.0) | 125.0 |
| Degree of nausea, 0-100 scale | 52.1 (25.0) | 52.0 |

40. Refer to Table 3. For the variable *body mass index,* the variance is:

a. 27.0

b. 27.02

c. 6.0

d. 36.0

41. Refer to Table 3. For the variable *number of positive nodes,* the statistics suggest that the
 distribution is:

a. Positively skewed

b. Negatively skewed

c. Symmetric

d. Normal

42. Refer to Table 3. Assume that the distribution for the variable *degree of nausea* is
 normally distributed. In such a case, out of the 100 sample members, approximately how
 many gave a nausea rating of 77 or higher?

a. 0

b. 3

c. 16

d. 34

43. Refer to Table 3. Which variable in Table 3 is most likely to be negatively skewed?

a. Age

b. Body mass index

c. Dose of cyclophosphamide

d. Dose of doxorubicin

44. Refer to Table 3. For the variable *body mass index,* what would be the standard score for
 a person whose BMI was 21.0?

a. -1.0

b. 0.0

c. 1.0

d. 2.0

45. Another name for a crosstab table is a*:*

a. Scatterplot

b. Frequency distribution

c. Contingency table

d. Relative risk table

46. In a 4 X 3 contingency table, how many variables would there be?

a. 2

b. 4

c. 7

d. 12

47. In a 4 X 3 contingency table, how many cells would there be?

a. 2

b. 4

c. 7

d. 12

48. Which measurement scale(s) are most amenable to cross-tabulation?

a. Nominal only

b. Nominal and ordinal

c. Nominal, ordinal, and interval

d. Nominal, ordinal, interval, and ratio

49. A widely reported and intuitively appealing risk index for comparing risk outcomes is:

a. Relative risk (RR)

b. Absolute risk (AR)

c. Odds ratio (OR)

d. Number needed to treat (NNT)

50. Risk indexes such as ARR, RR, OR, and NNT are *not* appropriate when:

a. The study involves testing the effects of an intervention

b. A prospective (cohort) design comparing risk groups is used

c. The independent and/or dependent variable is not dichotomous

d. The outcome is a nominal-level variable

51. When the value of RR is close to 1.0, this means that:

a. The OR and the RR are far apart in value

b. Absolute risk is low

c. Exposure to the risk factor had a large effect on the outcome

d. Exposure versus nonexposure to the risk factor is unrelated to the outcome

52. If a scatterplot has data points that are tightly packed along a diagonal that slopes from
 the upper left to the lower right of the graph, the correlation between variables is:

a. Strongly positive

b. Weakly positive

c. Strongly negative

d. Weakly negative

53. Product–moment correlation coefficients are used to communicate information about:

a. Risks

b. Intervention effects

c. The magnitude and direction of curvilinear relationships

d. The magnitude and direction of linear relationships

54. Which of the following coefficients indicates the strongest relationship?

a. .77

b. -.89

c. .00

d. .50

55. If the value of *r* between *X* and *Y* is .90, what percentage of the variance in *Y* is explained
 by *X*?

a. 0%

b. 45%

c. 81%

d. .90%

56. For which of the following pairs of variables would it make sense to compute a product–
 moment correlation coefficient?

a. Height and weight

b. Race/ethnicity and height

c. Race/ethnicity and marital status

d. Marital status and weight

57. A researcher found a correlation of -.24 between scores on a self-esteem scale and
 number of alcoholic drinks consumed in the prior month. What does this mean?

a. People who drank more alcohol had a slight tendency to have higher self-esteem.

b. People who drank more alcohol had a slight tendency to have lower self-esteem.

c. Drinking more alcohol tended to cause lower self-esteem.

d. Having lower self-esteem tended to cause people to drink more alcohol.

58. How many variables are in a correlation matrix with four rows and four columns?

a. 4

b. 8

c. 16

d. It cannot be determined.

59. Which of the following values is will appear on the diagonal of a correlation
 matrix?

a. -1.00

b. .00

c. .10

d. 1.00

Questions 60 through 4.25 pertain to the following table (Table 4):

 **Table 4**

**Cognitive Impairment Status and Fall Incidence in Hospitalized Elders**

|  |  |  |
| --- | --- | --- |
|  | **Fall?** | **Total** |
| **Yes** | **No** |
| Cognitive Impairment? | Yes | 10 | 30 | 40 |
| No | 10 | 90 | 100 |
| **Total** | 20 | 120 | 140 |

60. Refer to Table 4. What percentage of elders in this sample had a fall?

a. 14.3%

b. 20.0%

c. 25.0%

d. 85.7%

61. Refer to Table 4. What numbers are in the denominator for calculating row percentages?

a. 20, 120

b. 10, 10

c. 40, 100

d. 30, 90

62. Refer to Table 4. What percentage of people who fell were *not* cognitively impaired?

a. 0.0%

b. 10.0%

c. 14.3%

d. 50.0%

63. Refer to Table 4. What was the relative risk (RR) of falling for elders who were
 cognitively compared?

a. 2.00

b. 1.50

c. 2.50

d. 1.00

64. Refer to Table 4. What was the odds ratio (OR) for falling associated with
 cognitive impairment?

a. 2.00

b. 0.33

c. 2.50

d. 3.00

65. Probabilities are traditionally shown as values ranging from \_\_\_\_ to \_\_\_\_.
 (Fill in the blanks.)

a. -1.00, +1.00

b. 0.0, 1.00

c. 0.0, 100.0

d. -100.0, +100.0

66. On a 36-slot roulette wheel (that is, excluding values for “0” or “00”), what is the
 probability of a roulette spin yielding an even number?

a. .028

b. .25

c. .50

d. 1.00

67. What does the symbol H0 represent?

a. A directional hypothesis

b. A nondirectional hypothesis

c. A research hypothesis

d. A null hypothesis

68. Descriptive statistics are rarely exactly equal to population parameters because of:

a. Sampling error

b. Attrition bias

c. Type I errors

d. Type II errors

69. A sampling distribution of the mean is a distribution of:

a. Population values from an entire population

b. Sample values from a random sample

c. Sample means from an infinite number of samples of a given size

d. Sample values from a sample of samples of a given size

66. In a sampling distribution of the mean, which of the following is true?

a. The mean is equal to 0.0.

b. The mean is equal to the population mean ().

c. The distribution is a *t* distribution.

d. The distribution is a binomial distribution.

67. The statistic referred to as the *SE*$(\overbar{X})$is:

a. The standard deviation of population values

b. The standard deviation of a sampling distribution of means

c. The standard deviation of sample values

d. The standard estimate of the mean

68. The formula for estimating the *SE*$(\overbar{X})$involves which two components?

a. The mean and *SD* from a sample (*s*)

b. The mean and *SD* from the population ()

c. The *SD* from a sample (*s*) and number of cases in the population (*N*)

d. The *SD* from a sample (*s*) and number of cases from that sample (*n*)

69. Given a mean of $\overbar{X}= $50.0 and a standard deviation *s =* 10.0, which of the following
 would have the smallest estimated *SE*$(\overbar{X})$?

a. A sample size of 50

b. A sample size of 250

c. A sample size of 500

d. It cannot be determined without knowing the size of the population.

70. Because of an interest in precision, researchers prefer:

a. Small *SE*$(\overbar{X})$

b. Large *SE*$(\overbar{X})$

c. A true *SE*$(\overbar{X})$rather than an estimated *SE*$(\overbar{X})$

d. An *SE*$(\overbar{X})$based on population rather than sample values

71. Which of the following statements is true?

a. Parameter estimation is more frequently used by nurse researchers than hypothesis
 testing.

b. Point estimation is preferred to interval estimation.

c. Interval estimation involves constructing a confidence interval around a point estimate
 of a parameter.

d. Estimation procedures are appropriate for estimating population means but not
 percentages.

72. Which of the following would be an element in the formula for computing confidence
 limits around a sample mean?

a. The 95% *CI*

b. A value from the *t* distribution for a specified sample size

c. The value of 1.96, corresponding to *z*

d. The sample *SD*

73. In the expression, $\overbar{X}$= 10.0, 95% *CI* = (8.0, 12.0), which of the following is true?

a. There is a 5% probability that the population mean is greater than 12.0.

b. There is a 2 ½% probability that the population mean is greater than 12.0.

c. 95% of all population means are between 8.0 and 12.0.

d. The population mean has a 95% probability of being 10.0.

74. Which of the following is true regarding a 95% *CI* for a population proportion (*p*)?

a. A 90% *CI* for population proportion (*p*) would be wider than the 95% *CI*.

b. The smaller the sample size, the narrower the *CI*.

c. The closer the proportion is to 0.50, the wider the *CI*.

d. The larger the sample size, the wider the *CI*.

75. In hypothesis testing, which of the following is true?

a. The null hypothesis $(H\_{o})$ is assumed to be true.

b. Researchers seek to reject the null hypothesis with 100% certainty.

c. If  there is a 5% chance a false null hypothesis will not be rejected.

d. The null hypothesis is the same as the research hypothesis.

76. A Type I error:

a. Is the inverse of power

b. Means that the researcher has come to a false-negative conclusion

c. Only occurs when the test is two tailed

d. Has a risk of occurrence that is under the researchers’ control by designating α

77. The level of significance (significance criterion) of a statistical test:

a. Is the power of the test to reject the null when it is false

b. Is a probability level, typically .05

c. Is a probability level, typically .95

d. Is automatically computed when tests are performed by computer

78. The probability of committing a Type II error:

a. Is greater when α = .01 than when α = .05

b. Is always greater than the probability of committing a Type I error

c. Is equivalent to 1 - α

d. Is under the control of researchers by establishing a level for β

79. In a one-sample *­t*-test*:*

a. A sample mean for one group is tested against a sample mean for another group

b. A sample mean is tested against the value of 50.0

c. A sample mean is tested against a hypothesized value for the population mean

d. A sample mean is tested against the population parameter

80. When a result is statistically significant, this means that:

a. The result has a low probability of being due to chance factors

b. The result is true

c. The result is clinically important

d. The result will be replicated in other similar studies

81. Which of the following two terms belong together?

a. Null hypothesis, one-tailed test

b. Directional hypothesis, one-tailed test

c. Null hypothesis, two-tailed test

d. Directional hypothesis, two-tailed test

82. Nonparametric tests are more likely to be appropriate than parametric tests when:

a. The response variable is severely skewed

b. The response variable is measured on at least an interval scale

c. The sample size is large

d. Values in the population are normally distributed

83. In a one-sample *t-*test for a study involving 200 study participants, *df* would equal:

a. .05

b. 1

c. 199

d. 200

Questions 84 through 86 pertain to the following table (Table 5), which presents fictitious results regarding factors associated with delayed extubation after cardiac surgery:

**Table 5**

**Odds Ratios for Late Extubationa after Cardiac Surgery, by Patient Characteristics (*N* = 673)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Extubation < 5 Hours (%) | Extubation > 5 Hours (%) | OR | 95% *CI* |
| Female patient | 19.2 | 29.8 | 1.66 | 1.14 - 2.60 |
| White patient | 89.6 | 91.3 | 1.09 | 0.80 - 1.21 |
| Hypertensive | 62.7 | 73.9 | 1.58 | 1.09 - 2.24 |
| Prior CABG | 9.4 | 16.0 | 2.03 | 1.22 - 3.65 |

aLate extubation = More than 5 hours of mechanical ventilation

84. Refer to Table 5. Which of the following numbers is a point estimate for a risk index for
 delayed extubation for female patients?

a. 19.2

b. 29.8

c. 1.66

d. 1.14

85. Refer to Table 5. Which patient characteristic was most associated with a higher risk of
 delayed extubation?

a. Sex

b. Race

c. Hypertensive status

d. Prior experience with CABG

86. Refer to Table 5. Which patient characteristic was *not* associated with a significantly
 higher risk of delayed extubation?

a. Sex

b. Race

c. Hypertensive status

d. Prior experience with CABG

87. A two-sample *t-*test would be appropriate for which of the following directional
 hypotheses?

a. Ha: *p*1 ≠ *p*2

b. Ha: µ1 ≠ µ2

c. Ha: µ1 > µ2

d. Ha: *p*1 > *p*2

88. Which of the following is *not* an assumption for the *t-*test?

a. Normally distributed variances in the populations

b. Normally distributed response values in the populations

c. Homogeneity of variances in the populations

d. Random sampling of cases from the populations

89. Which of the following is true about *t-*tests?

a. They are used when the response is a nominal-level variable.

b. They should always be used when the response variable is measured on an interval or
 ratio scale.

c. Can be greatly affected by outliers in the sample.
 d. They require measurements from people at least two points in time.

90. If cholesterol levels in twins were being compared, one of whom in each pair was
 randomly assigned to a special dietary intervention, the appropriate statistical test would
 be the:

a. One-sample *t-*test

b. Pooled *t-*test

c. Non-pooled t- test

d. Paired *t-*test

91. If smokers and nonsmokers were compared in terms of number of days absent from work
 annually, the appropriate statistical test would be the:

a. One-sample *t-*test

b. Independent samples *t-*test

c. Paired *t-*test

d. Chi-square test

92. In the basic formula for the pooled *t-*test, what is in the denominator?

a. The standard error of the difference

b. The variance of the difference

c. The standard error of the mean

d. The pooled standard deviation

93. A statistical test that can be used to test for equality of variances in the distributions for
 two groups is:

a. The one-sample *t-*test

b. The two-sample *t-*test

c. Levene’s test

d. Chi-square test

94. A *t* was calculated to be *t = -2.10* for a comparison of 50 men and 50 women with regard
 to attitude toward organ donation, measured on a 10-item scale. The corresponding
 p-value is p = .038. Based upon these results we:

a. Can accept the null hypothesis that men and women have comparable attitudes

b. Can reject the null hypothesis that men and women have comparable attitudes

c. Can accept the alternative hypothesis that men have more favorable attitudes

d. Can accept the alternative hypothesis that women have more favorable attitudes

95. In a independent samples *t-*test situation, confidence intervals are constructed around:

a. The difference between two means

b. Each of the two means

c. The pooled variance

d. The two separate variances

Questions 96 through 99 pertain to the following table (Table 6), which presents fictitious results regarding the effects of guided imagery on pain outcomes among patients with cancer.

**Table 6**

**Pain Outcomes for Cancer Patients Receiving a Guided Imagery Intervention (*n =* 100) Versus Those Receiving Usual Care (*n* = 100)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Outcome** | **Usual Care Group****Mean (*SD*)** | **Guided Imagery Group****Mean (*SD*)** | ***t*** | ***p*** |
| Present pain intensity | 5.3 (1.5) | 4.7 (1.4) | 3.24 | .002 |
| Pain intensity—pain at its worst  | 8.5 (1.8) | 8.3 (1.7) | 1.29 | .22 |
| Pain distress | 6.8 (1.1) | 5.8 (1.2) | 5.34 | <.001 |
| Pain interference | 42.1 (6.1) | 39.9 (6.0) | 2.77 | .02 |

96. Refer to Table 6. Which statistical test is most likely being reported in this table?

a. One-sample *t-*test

b. Independent samples *t-*test, pooled variance formula

c. Independent samples *t-*test, unequal variance formula

d. Dependent samples *t-*test

97. Refer to Table 6. For which outcome would the researcher need to fail to reject the null
 hypothesis?

a. Present pain intensity

b. Pain intensity—pain at its worst

c. Pain distress

d. Pain interference

98. Refer to Table 6. What were the degrees of freedom in these analyses?

a. 99

b. 100

c. 198

d. 199

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99. What distinguishes analysis of variance (ANOVA) from *t-*tests?

a. The null hypotheses regarding the equality of means

b. The underlying assumption of homogeneity of variances

c. The number of groups being compared

d. The assumption of random samples from the populations.