Field Nursing CHAPTER 2 - The SPINE of statistics

Multiple choice

1. The standard deviation is the square root of

a. The coefficient of determination

b. The sum of squares

c. The variance

d. The range

Ans: C

2. A frequency distribution in which low scores are most frequent (i.e., bars on the graph are highest on the left hand side) is said to be

a. Positively skewed

b. Leptokurtic

c. Platykurtic

d. Negatively skewed

Ans: A

3. If the scores on a test have a mean of 26 and a standard deviation of 4, what is the *z*-score for a score of 18?

a. –2

b. 11

c. 2

d. –1.41

Ans: A

4. Which of the following is true about a 95% confidence interval of the mean of a given sample

a. 95 out of 100 sample means will fall within the limits of the confidence interval.

b. There is a 95% chance that the population mean will fall within the limits of the confidence interval.

c. 95 out of 100 population means will fall within the limits of the confidence interval.

d. There is a .05 probability that the population mean falls within the limits of the confidence interval.

Ans: B

5. What does a significant test statistic tell us?

a. There is an important effect.

b. The hull hypothesis is false.

c. There is an effect in the population of sufficient magnitude to be scientifically interesting.

d. All of the above.

Ans: C

6. A Type I error is when:

a. We conclude that there is a meaningful effect in the population when in fact there is not.

b. We conclude that there is not a meaningful effect in the population when in fact there is.

c. We conclude that the test statistic is significant when in fact it is not.

d. The data we have typed into SPSS are different than the data collected.

Ans: A

7. If we calculated an effect size and found it was *r* = .42, which expression would best describe the size of effect?

a. Small

b. Small to medium

c. Large

d. Medium to large

Ans: D

8. Which of these statements about statistical power is not true?

a. Power is the ability of a test to detect an effect.

b. We can use power to determine how big a sample is required to detect an effect of a certain size.

c. Power is linked to the probability of making a Type I error.

d. All of the above are true.

Ans: D

9. What is a significance level?

a. The level at which statistics finally become meaningful to a stein.

b. The impact that reporting statistics incorrectly could have.

c. A pre-set level of probability that the results are correct.

d. A pre-set level of probability at which it will be accepted that results are due to chance or not.

Ans: D

10. What is the conventional level of probability that is often accepted when conducting statistical tests?

a. .1

b. .05

c. .5

d. .001

Ans: B

11. A null hypothesis

a. States that the experimental treatment will have an effect.

b. Is rarely used in experiments.

c. Predicts that the experimental treatment will have no effect.

d. None of the above.

Ans: C

12. Which of the following terms best describes the sentence: ‘In a blind tasting, people will not be able to tell the difference between margarine and butter’?

a. A directional hypothesis

b. An operational definition

c. A null hypothesis

d. A non-directional hypothesis

Ans: D

13. The aim of experimental research is to

a. Be a phenomenon

b. Cause a phenomenon

c. Investigate what caused a phenomenon

d. Prevent a phenomenon

Ans: C

14. ‘Sleep deprivation will reduce the ability to perform a complex cognitive task’. State the direction of this hypothesis

a. Directional

b. Non-directional

c. Both

d. Not enough information given

Ans: A

15. In experiments the independent variable is manipulated to determine

a. Effects on the individual participants

b. Effect on the dependent variable

c. Effects of certain stimuli

d. Relation to other variables

Ans: B

16. A standard deviation that has a value of 0 is best explained by which of the following statements?

a. Data points are distant to the mean.

b. Data points equal the mean.

c. All the scores are the same.

d. Data points are close to the mean.

Ans: C

17. Confidence intervals are a means of assessing the accuracy of sample data. If you read that the average expected range of birth weight of newborns in your area falls between 2 and 12 lbs, what additional information is required in order to predict a 95% confidence interval in terms of birth weights?

a. *z*-score and standard error of the sample

b. mean and standard deviations of the sample, and *z*-score

c. mean and standard deviations of the sample

d. mean and *z*-score of the sample

Ans: B

18. What is the significance of data (e.g., as in Q17) that fall within confidence intervals?

a. It reflects the national average.

b. It reflects statistical significance.

c. It reflects a true value of the predicted weight.

d. It is most likely to be similar to all the values that are contained within the range.

Ans: D

19. What is a *t*-distribution?

a. A representation of probability distributions that change shape as the sample size increases\*

b. A means of calculating the standard error

c. A representation of the distribution of the means

d. A means of calculating probability

Ans: A

20. Which of the following statements would you consider to be the null hypothesis in relation to a research proposal which states that it is investigating the impact of nutrition on wound healing time?

a. There is no relationship between the two variables in the population.

b. There is a relationship between the two population variables.

c. There are additional factors which need consideration to this research .

d. There are no additional factors which need to be considered in this research.

Ans: A

21. The significance of probability is usually expressed as a value occurring somewhere between 0 and 1. Which of the following would be considered the most highly significant in statistical terms?

a. .1

b. .05

c. .025

d. .01\*

Ans: D

22. Which of the following statements would be considered a two-tailed hypothesis?

a. A female doctor will be more empathetic than her male counterpart.

b. As rates of immunization for measles increase, the incidence of measles will decrease.

c. It is clear that there is a relationship between a healthy balanced diet and feelings of well-being.

d. The use of antibiotics will not impact the progression of a viral infection.

Ans: C

23. Of the following results of studies undertaken, which is considered to have been a Type II error?

a. A study of the use of silver nitrate dressings versus the use of acupuncture demonstrated equal healing times for the treatment of leg ulcers within the elderly community. The researchers concluded that both types of treatment were equally effective.

b. A study of sleep behaviour showed that there is a relationship between raised body temperature and the number of hours of sleep. The conclusion drawn was that a person would sleep more if they had a high body temperature.

c. In a study of children’s reading habits at home, a relationship between reading and eating bananas was found. The conclusion was drawn that eating bananas improved reading ability.

d. Following the discovery that a person’s pain threshold increases when subjected to repeated electrical stimulation, researchers concluded that shock therapy is recommended for pain control.

Ans: A

24. Which of the following statements best describes the value of an ‘effect size’ to research?

a. It has a key role to play when calculating assumptions about collected data.

b. It is a vital statistic when calculating the significance of an experimental study.

c. It is a measure of the power of an experiment and therefore its significance.

d. It is a standardized measure that allows for the comparison across different studies that have used different variables or measurement scales.

Ans: D

25. In order to determine the effects of a specific drug on the treatment of childhood asthma, randomized controlled trials are usually conducted. Which of the following statistical methods will provide the best conclusions for the trials conducted?

a. Patient survey

b. Meta-analysis

c. Observational study

d. Standardized *t*-test

Ans: B