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SUBJECT= RESEARCH METHODOLOGY

I.D= 13795

PROGRAME= BS DENTAL TECHNOLOGY (6TH SEMESTER)

SECTION = B

Answer no. 1:

COHORT STUDY:

An observational design comparing individuals with a known risk factor or exposure with others without the risk factor or exposure, Looking for a difference in the risk (incidence) of a disease over time.

CHARACTERISTICS:

Follow – up period (prospective; retrospective)

MERITS:

No temporal and ambiguity ; several outcomes could be studied at the same time ; suitable for incidence estimation.

LIMITATIONS (OF PROSPECTIVE TYPE):

Expensive time consuming in efficient for rare disease loss to follow up

EFFECT MEASURE:

Risk ratio (relative risk)

TYPES OF COHORT STUDY:

1) **PROSPECTIVE COHORT STUDY:**
   Prospective cohort study is a longitudinal cohort study that follow over time a group of similar individual (cohorts) who differ with respect to certain factor under study, to determine how these factor effect rates of a certain out come. The prospective study is important for research on the etiology of diseases and disorders. distinguish feature of a prospective cohort study as that at the time that the investigator begin enrolling subject and collecting baseline exposure information, none of the subjects have developed any of the outcomes of interest. After baseline information is collected, subjects in a

prospective cohort study are then followed "longitudinally," i.e. over a period of time, usually for years, to determine if and when they become diseased and whether their exposure status changes outcomes. In this way, investigators can eventually use the data to answer many questions about the associations between "risk factors" and disease outcomes.

2) **RETROSPECTIVE COHORT STUDY:**

A retrospective cohort study, also called a historic cohort study, is a longitudinal cohort study used in medical and psychological research. A cohort of individuals that share a common exposure factor is compared with another group of equivalent individuals not exposed to that factor, to determine the factor's influence on the incidence of a condition, such as disease or death. Retrospective cohort studies have existed for approximately as long as prospective cohort studies.

The retrospective cohort study compares groups of individuals who are alike in many ways but differ by a certain characteristic (for example, female nurses who smoke and ones who do not smoke) in terms of a particular outcome (such as lung cancer) Data on the relevant events for each individual (the form and time of exposure to a factor, the latent period, and the time of any subsequent occurrence of the outcome) are collected from existing records and can immediately be analyzed to determine the relative risk of the cohort compared to the control group. This is fundamentally the same methodology as for a prospective cohort study, except that the retrospective study is performed post-hoc, looking back. The prospective study looks forward, enrolling patients unaffected by the outcome and observing them to see whether the outcome has occurred. However, both kinds of cohort studies share the same starting point (considering data from before the occurrence of the outcome). The first objective is still to establish two groups - exposed versus non-exposed - which are then assessed retrospectively to establish the most likely temporal sequence of events leading to the current disease state in both the exposed and unexposed groups. Retrospective cohort studies require particular caution because errors due to confounding and bias are more common than in prospective studies.

Answer no.2:

SAMPLE :

The selected part of the population for research is known as sample. It is difficult for a researcher to study the whole population due to limited resources e.g. time, cost and energy hence the researcher selects a part of the population for his study, rather than studying the whole population.

TYPES OF NON PROPABILITY SAMPLING TECHNIQUE:

Quota sampling

With proportional quota sampling, the aim is to end up with a sample where the strata (groups) being studied (e.g., males vs. females students) are proportional to the population being studied. If we were to examine the differences in male and female students, for example, the number of students from each group that we would include in the sample would be based on the proportion of male and female students amongst the 10,000 university students.

Convenience sampling

A convenience sample is simply one where the units that are selected for inclusion in the sample are the easiest to access. In our example of the 10,000 university students, if we were only interested in achieving a sample size of say 100 students, we may simply stand at one of the main entrances to campus, where it would be easy to invite the many students that pass by to take part in the research.

Purposive sampling

Purposive sampling, also known as judgmental, selective or subjective sampling, reflects a group of sampling techniques that rely on the judgment of the researcher when it comes to selecting the units (e.g., people, cases/organizations, events, pieces of data) that are to be studied. These purposive sampling techniques include maximum variation sampling, homogeneous sampling, typical case sampling, extreme (or deviant) case

sampling, total population sampling and expert sampling. Each of these purposive sampling techniques has a specific goal, focusing on certain types of units, all for different reasons. The different purposive sampling techniques can either be used on their own or in combination with other purposive sampling techniques.

Self-selection sampling

Self-selection sampling is appropriate when we want to allow units or cases, whether individuals or organizations, to choose to take part in research on their own accord. The key component is that research subjects (or organizations) volunteer to take part in the research rather than being approached by the researcher directly.

Snowball sampling

Snowball sampling is particularly appropriate when the population you are interested in is hidden and/or hard-to-reach. These include populations such as drug addicts, homeless people, individuals with AIDS/HIV, prostitutes, and so forth.

Answer no.3:

DATA: research data, unlike other types of information, is collected, observed, or created, for purposes of analysis to produce original research results. Research data comes in many different formats and is gathered using a wide variety of methodologies. Research data are collected and used in scholarship across all academic disciplines and, while it can consist of numbers in a spreadsheet, it also takes many different formats, including videos, images, artifacts, and diaries. Whether a psychologist collecting survey data to better understand human behavior, an artist using data to generate images and sounds, or an anthropologist using audio files to document observations about different cultures, scholarly research across all academic fields is increasingly data-driven.

TYPES OF DATA:

Observational Data

Observational data are captured through observation of a behavior or activity. It is collected using methods such as human observation, open-ended surveys, or the use of an instrument or sensor to monitor and record information -- such as the use of sensors to observe noise levels at the Mpls/St Paul airport. Because observational data are captured in real time, it would be very difficult or impossible to re-create if lost.

Experimental Data

Experimental data are collected through active intervention by the researcher to produce and measure change or to create difference when a variable is altered. Experimental data typically allows the researcher to determine a causal relationship and is typically projectable to a larger population. This type of data are often reproducible, but it often can be expensive to do so.

Simulation Data

Simulation data are generated by imitating the operation of a real-world process or system over time using computer test models. For example, to predict weather conditions, economic models, chemical reactions, or seismic activity. This method is used to try to determine what would, or could, happen under certain conditions. The test model used is often as, or even more, important than the data generated from the simulation.

Derived / Compiled Data

Derived data involves using existing data points, often from different data sources, to create new data through some sort of transformation, such as an arithmetic formula or aggregation. For example, combining area and population data from the Twin Cities metro area to create population density data. While this type of data can usually be replaced if lost, it may be very time-consuming (and possibly expensive) to do so.

SECTION A.

NOTE: Highlight the correct option of the given MCQs from section A. attempt all 3 questions from section B.

1. **You may remember that three years ago there was a multistate outbreak of illnesses caused by a specific and unusual strain of Listeria monocytogenes. As part of the investigation of this outbreak, CDC workers checked the food histories of 20 patients infected with the outbreak**

strain and compared them with the food histories of 20 patients infected with other Listeria strains. This study design is best described as which one of the following:

A. Analytical, experimental
B. observational, case-control
C. Analytical, observational,
D. cohort Descriptive

2. **A published study follows a large group of women with untreated dysplasia of the uterine cervix, documenting the number who improve, stay unchanged, or progress into cervical cancer. This study design is best described as which one of the following:**

A. Analytic, experimental
B. Analytic, observational, cohort
C. Analytic, observational, case/control
D. Descriptive, observational

3. **A community assesses a random sample of its residents by telephone questionnaire. Obesity is strongly associated with diagnosed diabetes. This study design is best described as which one of the following:**

A. Case-control
B. Cohort
C. Cross-sectional
D. Experimental

4. **Based on a list of residents from election rolls, 2/3 of men in a large city are invited (including repeated educational urgings) and 1/3 of men are not invited to be screened by PSA blood test for prostate cancer. Over the next 10 years the two groups are compared as to the rate of death from prostate cancer. This study design is best described as which one of the following:**

A. Case-control
B. Cohort
C. Cross-sectional
D. Experimental

5. **In a case-control study of alcohol intake and bladder cancer, cases and matched controls are each interviewed by interviewers who are not blinded as to whether the subject is a case or a control. Many of the interviewers are in fact convinced that drinking alcohol is a cause of bladder cancer. Is this likely to represent a bias?**

A. No, because the interviewers can't affect whether the subjects are considered cases or controls; that's already decided
B. Yes, but it's hard to predict the direction of the bias.
C. Yes, and would predispose to a rejection of the null hypothesis.
D. Yes, and would predispose to an acceptance of the null hypothesis.

6. **Interviewing all members of a given population is called:**

A. a sample.
B. a Gallup poll.
C. a census.
D. a Nielsen audit.

7. **Sampling means following a sequence of stages. Which ONE of the following stages should come before the others?**

A. Proceed with the fieldwork.
B. Find suitable source for the population members.
C. Define the people of interest.
D. Examine the objective of the study.

8. **Which ONE of these sampling methods is a probability method?**

A. Purposive.
B. Judgement.
C. Convenience.
D. Simple random.

9. **Which ONE of the following is the benefit of using simple random sampling?**

A. We can calculate the accuracy of the results.
B. The results are always representative.
C. Interviewers can choose respondents freely.
D. Informants can refuse to participate.

10. Which ONE of the following is the main problem with using non-probability sampling techniques?

A. The expense.
B. The results are never representative.
C. Human judgment error.
D. Informants can refuse to participate.

11. Which ONE of the following is the best - but an often unused - way to decide on sample size?

A. By using industry standards.
B. By calculation.
C. By 'building blocks'.
D. By budget available.

12. Which ONE of the following methods is generally used in qualitative sampling?

A. Random digit dialling.
B. purposive.
C. Stratified random.
D. Simple random.

13. The median of 7, 6, 4, 8, 2, 5, 11 is

A. 6
B. 12
C. 11
D. 4

14. Number which occurs most frequently in a set of numbers is

A. mean
B. median
C. mode
D. None of above

15. **The mode of 12, 17, 16, 14, 13, 16, 11,** 14 is

A. 13
B. 11
C. 14
D. 14 and 16