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Unit – V

**TOOLS & METHODS OF DATA
COLLECTION**

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Data

- Data are the observable and measurable facts that provide information about the phenomenon under study.
- In research studies two types of data are collected primary and secondary sources.

Data Sources:

- A quality of research studies requires that highly reliable and valid data are collected. Information collected from different research studies generally depends on various sources like primary and secondary sources.

Types

Primary Sources:

- Data directly collected from research units, which may be individuals, objects or programs.
- They provide the first hand information that is collected by the researcher directly from the respondents or the situations which may be collected through interviews, questioning, observation, etc....

Types

Secondary Sources:

- They are data collected from either internal or external secondary sources.
- External sources involved existing materials such as published or unpublished records
- Published records may include journals, magazines, censuses reports... Unpublished records may include dissertations, patient records, thesis...
- Internal secondary sources are also known as private documents may include bio graphics, personal diaries, letters, etc...

Methods & Tools of Data Collection

Methods of data collection:

- The various steps used for gathering and analyzing data in a research investigation are known as the methods of data collection.

Technique of data collection:

- The means of gathering data with the use of specific tools that are used in given methods

Instruments/Tools of data collection

- Instrument is a device used to measure the concept of interest in a research project that the researcher uses to collect data.

| Method | Tools |
|-------------------|--|
| Interview | Interview schedule, opinionnaire |
| Questioning | Questionnaire, Opinionnaire, Attitude scale, VAS |
| Observation | Rating scale, Check lists, Anecdotes |
| Bio physiological | In vivo & In vitro bio physiological methods |
| Other methods | Projective technique, Q- sorts |

Selection of methods of data collection

- The nature of phenomenon under study
- Type of research subjects
- Type of research study
- Purpose of research study
- Size of the study samples

Cont...

- Distribution of target population
- Time frame of the study
- Literacy level of the subjects
- Availability of resource and manpower
- Researchers knowledge level and competences

Interview

Definition:

- An interview is a conversation between two or more people, where questions are asked by the interviewer to obtain information from the interview.
- It may be defined as the two way systematic conversation between an investigator and an informant initiated for obtaining information relevant to specific study.

Characteristics

- The participants, the interviewer and the respondents are stranger.
- It is a mode of obtaining verbal answers to questions put verbally.
- Investigator records information furnished by respondents
- It is a conversation with specific purpose
- It should not need face to face because it can be conducted over telephone also
- It is a conversation between two persons and is not always limited to a single respondent.
- It is not a standardized process. It can be modified according to situation.

Benefits

- Provide in-depth and detailed information
- Permits greater depth of response
- Data from illiterate subjects
- Higher response
- Clarify misunderstandings
- Ask questions at several level
- Helps to gather other supplementary information
- Use of special devices
- Accuracy can be checked
- Flexible and adaptable
- Unable to write

Types

Structured Interview:

- It is a mean of data collection in which the interview made with a detailed, standardized schedule. Same questions are put to all the respondents and in the same order.

Characteristics:

- It is formalized and has limited set of questions
- Each interview is presented exactly with same questions in same order
- It increases the reliability and credibility of research data

Cont...

Merits:

- Data from one interview to the next one are easily comparable.
- Recording and coding data does not pose any problem.
- Attention is not diverted to irrelevant and time consuming conversation.

Demerits:

- It tends to lose the spontaneity of natural conversation.
- The scope of exploration of information of data is limited.

Cont...

Unstructured Interview

- It is a method where in questions can be changed to meet the respondent's intelligence, understanding and beliefs. Questions are changed based on how each individual person responds to the questions.

Characteristics:

- It is not formalized & has open ended questions.
- The aim is to explore the information from the respondents.
- It increases the reliability & credibility of research data.
- It facilitates natural un obstructed proceedings of the interview procedure.

Cont...

Merits:

- It is less prone to interviewer's bias.
- It provides greater opportunity to explore the problem in an unrestricted manner.
- It is useful for gathering information on sensitive topics.

Demerits:

- The data cannot be comparable
- Time may be wasted in unproductive conversation.

Cont...

Semi Structured Interview

- It is a flexible method that allows new questions to be brought up during the interview depending upon the situation.

Characteristics:

- Interviewer prepares an interview guide, which is an informal list of topics and questions that the interviewer can ask in different ways from different participants.
- Interview guide helps researcher to focus on

Cont...

Indepth Interview

- This is an intensive and investigative interview conducted and aimed at studying the respondent's opinion & emotions on the basis of interview guide.

Cont...

Focused Group Interview

- It is an unstructured group interview technique where 8-12 members are brought together under the guidance of the trained interviewer, to focus on a specific phenomenon.

Characteristics:

- It consists of 8-12 members, who are homogeneous in terms of demographic & socioeconomic characteristics.
- Duration of interview is 1 and half to 2 hours.

Cont...

- All information including facial expression & body language are recorded.
- It has a moderator to lead the discussion.
- It is free from inflexibility of formal methods.
- There is plenty of opportunity for respondents to present their views.

Cont...

Merits:

- Wide range of information is collected.
- It stimulates new ideas and creative concepts.
- One person's comments may trigger a response from another one.
- It increases excitement.
- Participants feel more comfortable to answer in a group with similar interests.
- It involves many participants at one time.

Cont...

Demerits:

- There are chances of client and researcher bias.
- It is difficult to moderate.
- It is difficult to code, analyze & interpret.
- It is not a representative of general population.

Cont...

Telephone Interview

- This method of collecting information consists in contacting respondents on telephone itself.

Merits:

- More flexible & quick way of obtaining information.
- Cost is relatively less.
- Access to the respondent is easy through a telephone directory.
- No field staff is required.

Cont...

Demerits:

- Difficult to establish rapport between respondent and the interviewer.
- Surveys are limited to respondents who have telephone facilities.
- Respondent's characteristics, facial expression and environment cannot be observed.
- Possibility of bias of interviewer is more.

Interviewing Process

Preparation for Interview

- Fix-up appointment
- Appearance and dress
- Familiarity with interview schedule.

Pre Interview Introduction

- Researcher introduces himself to all respondents respectfully.
- Identify respondents by name.
- Choose a setting with as little distraction as possible
- Explain purpose of the interview
- Indicate how long the interview usually takes

Cont...

Developing Rapport

- After introduction, the researchers start developing rapport with respondents. This is developed through confidence-building & understanding the concerns of respondents.

Carrying interview forward

- Start the interview
- Ask only one question at a time
- Repeat the question if necessary
- Listen carefully to the subjects answer

Cont...

- Observe the subjects facial expressions, gestures and tone of voice
- Do not show signs of surprise, shock or anger
- Do not hurry the interview, if sessions is too prolonged, introduce a stimulus.

Recording the interview

- Good information can be taken by note-taking
- Shorthand or tape recorder can be used to record the response.

Cont...

Closing the interview

- After the interview, a polite leave of the respondent by friendly smile & saying good bye.

Cont...

Advantages

- They are used to obtain people's feelings, perceptions and opinions.
- High response rate is achieved
- Respondents own words are recorded
- Meaning of questions can be clarified

Disadvantages

- Time consuming and costly affairs
- High degree chances of interviews bias

Questionnaire

- A questionnaire is structured instrument consisting of a series of questions prepared by researcher that a research subject is asked to complete, to gather data from individuals about knowledge, attitude and feeling.
- A questionnaire is a structured self report paper and pencil instrument that a research subject is asked to complete.

Types

- *Open Ended Questions*
- *Closed Ended Questions*
 - *Dichotomous Questions*
 - *Multiple Choice Questions*
 - *Cafeteria Questions*
 - *Rank Order Questions*
 - *Contingency Questions*

Cont...

Open Ended Questions

- They are the questions which provide opportunity to the respondents to express their opinions and answers in their own way.
- Ex: State your opinion about the quality of health care services in UP?

Cont...

Closed Ended Questions

- These questions offer respondents a number of alternative replies, from which the subjects must choose the one that most likely matches the appropriate answer.

Cont...

Dichotomous Questions:

- This requires respondents to make a choice between two responses such as yes or no, true or false.

Multiple Choice Questions:

- These questions require respondents to make a choice between more than two responses.

Cont...

Cafeteria Questions:

- They allow respondents to select a response that most closely corresponds to their view.

Ex: Q: what do you think about hormone replacement therapy?

- It is dangerous, it should be avoided
- One should be cautious while using it
- I am uncertain about my views
- It is beneficial, should be promoted

Cont...

Rank Order Questions:

- These questions ask respondents to rank their responses from most favorable to least favorable.

Ex: Q: what according to you is most important for your life?

- Money
- Education
- Family
- Health

Cont...

Contingency Questions:

- A question is asked further only if the respondent gives a particular response to previous question.

Ex: Q: Are you stressed?

- No
- Yes If yes Why.....

Guidelines

- It must be developed exactly in accordance with study objectives
- It should begin with instructions for the respondents to provide responses
- It should be concise, precise & brief
- It should be in accordance with respondents' knowledge
- It should be very clear & simple

Cont...

- As far as possible avoid open ended questions
- Controversial and ambiguous questions should be avoided
- There should be logical sequence of the questions
- Questions should from general to more specific
- Avoid negative and double questions
- Use positive statements

Cont...

Advantages

- They are cost effective
- They are ease to analyze
- They require less time and energy to administer
- They reduce bias
- They are used for larger sample size

Cont...

Disadvantages

- Not suitable for all
- Low response rate
- Provides only superficial information
- Chances of misinterpretation
- People can lie and answer vaguely

ATTITUDE SCALES

- A scale is a device designed to assign a numeric score to people to place them on a continuum with respect to attributes being measured.

Types

- Likert Scale
- Semantic Differential Scale
- Visual Analogue Scale
- Observations
- Rating Scales
- Checklist

Likert Scale

- It was named after a psychologist Rensis Likert, who developed it in 1932, as a psychological concept measurement scale.
- Primarily original version of this scale was developed with five point scale (Strongly Agree, Agree, Uncertain, Disagree, Strongly Disagree). Now in recent time one can even observe the likert scale with four points (Strongly Agree, Moderately Agree, Uncertain, Disagree) to seven points (Very Strongly Agree, Strongly Agree, Agree, Uncertain, Disagree, Moderately Disagree, Very Strongly Disagree).

Cont...

Definition:

- It is a composite measurement scale used to measure attitude, values and feelings of the people that involve summation of scores on the set of positive and negative declarative statements regarding measuring variables to which respondents are asked to indicate the degree of agreement or disagreement.

Cont...

Uses:

- Used to measure the attitude, value and feelings of the people about specific concepts.
- Used to have quantified measurement of qualified attributes
- It collects the opinions of the people with various attitudes, emotions and feelings towards a particular concept

Cont...

Characteristics:

- Psychological measurement tool
- Illustrate in nature
- Neutral statements
- Bipolar scaling method – Positive and Negative Declarative statements
- Measurement of specific number of scaling categories.

Cont...

Advantages:

- Easy to construct and administer
- It is considered more reliable and valid tool
- Less time consuming

Disadvantages:

- Respondents may feel forced to answer the questions
- Feelings may not be fully assessed
- Casual approach of respondents may provide misleading data

Share Your Feedback

Strongly
Disagree

Disagree

Neutral

Agree

Strongly
Agree

I believe
this product
was a good
value



I would
recommend
this product
to others



Semantic Differential Scale

- It is a type of rating scale designed to measure the connotative meaning of objects, events and concepts. These connotations are used to derive the respondents attitude towards the objects, events and concepts.

Usage:

- Patient Satisfaction Survey
- Customer Satisfaction Survey
- Employee Survey
- Marketing Survey

Cont...

Advantages

- A convenient method to assess the beliefs, attitudes and values in quantitative form
- Easy to administer
- Provide reasonable valid and reliable quantitative data

Disadvantages:

- It is difficult to select the relevant concepts
- It is time consuming to find appropriate
indicative points

Visual Analogue Scale

- It is a tool used to help a person rate the intensity of certain sensations and feelings such as pain.
- VAS is a self reported measure consisting simply of 10cm line with statement at each end representating one extreme of the dimension being measured.

Uses:

- To measure the level of pain, anxiety, mood, quality of sleep and functional ability

Cont...

Advantages

- It is reliable and valid tool to measure the intensity of certain sensations and feelings.
- The quantitative assessment is highly subjective phenomenon is possible by this scale

Disadvantages

- Cannot be used for comparing results for a group of individuals
- In measuring pain the scale does not afford the

Observations

- It is a way of gathering data by watching behavior, events or noting physical characteristics in their natural settings. Observations can be overt (everyone knows that they are being observed) or covert (everyone do not know that they are being observed).

Definition

- It is a technique for collecting all the data or acquiring information through occurrences that can be observed through senses with or

Cont...

Uses:

- To understand an ongoing process or situation
- To gather data on individual behavior or interaction between people
- To know about a physical setting
- Data collection where other methods are not possible

Types

- Structured Observation
- Unstructured Observation
- Participant Observation
- Non Participant Observation

Cont...

Structured Observation:

- In this researcher in advance prepares a structured or semi structured tool to observe the phenomenon under study. It is generally carried out by using tools like checklist, rating scale etc.

Unstructured Observation:

- It is used for complete and nonspecific observation, which is very well known by the researcher. The tools are used by researcher are
Log and field notes, Anecdotes, Field diary

Cont...

Participant Observation:

- In this observer may live or work in field and actively participate in ongoing activities for the extended period.

Non Participant Observation:

- In this observer works as an eaves dropper (secretly listening or observing), where an attempt is made to observe people without interacting with them.
- It is a technique where observer is not a

Cont...

Planning for observation

- Determine the focus
- Design a system for data collection
- Select the sites
- Select the observer
- Train the observer
- Time your observation appropriately

Cont...

Advantages:

- Collect data where and when an event is occurring
- Allows researcher to see what people do rather than relying on what people say, what did

Disadvantages:

- Susceptible to observer bias
- Can be expensive and time consuming
- Does not increase understanding of why people behave as they do

Rating Scales

- They are refers to a scale with a set of opinion, which describes varying degree of the dimensions of an attitude being observed.
- Rating scales is a device by which judgment may be qualified or an opinion concerning a trait can be systematized.

Types

- Graphic Rating Scale
- Descriptive Rating Scale
- Numerical Rating Scale
- Comparative Rating Scale

Cont...

Graphic Rating Scale:

- In this scale the performance is printed horizontally at various points from lowest to highest.

Descriptive Rating Scale:

- This type of rating scale do not use number but divide the assessment into series of verbal phrases to indicate the level of performance.

Cont...

Numerical Rating Scale:

- It divides the evaluation criteria into a fixed number of points, but defines only numbers at the extreme.

Comparative Rating Scale:

- The researcher makes a judgment about an attribute of a person by comparing it with that of a similar another person.

Cont...

Advantages:

- Easy to administer and score the measured attributes.
- It can be easily used for a large group
- It may be used for the assessment of interest, attitudes and personal characteristics.
- They are adaptable and flexible research instruments.

Disadvantages:

- It is difficult or dangerous to fix up rating about many aspects of individuals

Checklist

- A checklist is a simple instrument consisting prepared list of expected items of performances or attributes where are checked by researcher for the presence or absence

Characteristics:

- Observe one respondent at one time
- Clearly specify the characteristics of behavior to be observed
- The observer should be trained how to observe

Cont...

Advantages:

- Checklists allow inter individual comparisons
- It provides a simple method to record observation
- Adaptable to subject matter areas
- Helpful in evaluating procedural work
- It have objectivity to evaluate characteristics
- Decreases the chance of errors in observation

Cont...

Disadvantages:

- Does not indicate quality of performance
- Only limited component of overall clinical performance can be evaluated
- It has limited use in qualitative research

Bio Physiological Methods

Definition

- The method involves the collection of bio physiological data from subjects by using the specialized equipments to determine physical and biological status of subjects.

Purpose:

- To study physiological process
- To study physiological outcome of nursing care
- To evaluate nursing intervention

Types

In vivo Bio Physiological Methods

- The measurements are directly performed over the organism or study subject by using specialized instruments or equipments.
- Ex: BP, ECG

In vitro Bio Physiological Methods

- They are the measurements carried out outside the organism or study subject by using specialized instruments or equipments.
- Ex: Radiological Measurements,

Cont...

Advantages:

- They are relatively more accurate and error less
- They are more objective in nature
- Provide valid for targeted variables Ex:
thermometer for temperature
- Easily available in hospital settings.

Cont...

Disadvantages:

- Some of instruments are very costly
- It requires significant amount of training, knowledge and experience
- The results produced by these instruments may be affected by environment
- The use may cause fear and anxiety among participants
- Use of some method may have harmful effect

Projective Technique

Definition:

- These are the methods of measuring psychological attributes by providing respondents with unstructured stimuli to which they respond.

Types:

- Association Technique
- Completion Technique
- Construction Technique
- Expressive Technique

Cont...

Association Technique:

- This technique requires the subject to respond at the presentation of stimulus (word) with first thing that comes to mind, so as to extract information regarding words that have maximum association

Completion Technique:

- In this technique the subject is with stimulus and which is incomplete and the subject is required to complete it as he or she wishes.

Sentence Completion Test

Story Completion Test

Construction Technique

- In this the subject is required to produce or construct something at direction, usually a story or a picture.
 - Thematic Appreciation Technique
 - Rosenzweig Test
 - Rorschach Test
 - Holtzman Ink Blot Test
 - Tomkins – Horn picture Arrangement Test

Cont...

Thematic Appreciation Technique:

- It consists of set of pictures of normal everyday event and the respondents are asked to describe what they think that the pictures represent.

Rosenzweig Test:

- This test uses a cartoon format wherein we have series of cartoons with no words inserted in balloons. The respondents are asked to put their own word in an empty balloon space.

Cont...

Rorschach Test:

- This test consists of 10 cards having prints of ink blot where in the design happens to be symmetrical but meaningless. The respondents are asked to describe what they perceive in them.

Holtzman Ink Blot Test:

- It consists of 45 cards which are based on color, movement, shading and other factors. One response per card is interpreted at three

Cont...

Tomkins – Horn picture Arrangement Test:

- This test is designed for group administrations with five plates, each containing three sketches that may be arranged in different ways to portray sequences which participants considers reasonable.

Expressive Technique

A subject is asked to role-play, act, draw or paint a specific concept or situation. This technique focus on the matter in which the subject constructs something rather than on what it represents.

Choice Ordering

- The subjects have to explain why certain things are most important or rank or order or categorize certain factors associated with topic under research.

Miscellaneous Type

Drawing a picture:

- Each participant is given a blank piece of paper and a pencil and is asked to draw a picture that might offer some insights on behavior and attitudes.

Using Fantasy and Daydreaming:

- Participants are provided asked to describe topic related fantasies and daydreams in order to surface characteristics or features that are important to the study.

Clay modeling:

- Participants are provided with different colored clays and are requested to give shape to them to reflect their feelings and thought.

Cont...

Advantages:

- They can make a significant contribution if the research is concerned with beliefs, values, motivation and personality.
- These techniques provide a view of overall functioning of individuals
- This provide new energy in a group discussion and lighten the mood
- Respondents do not perceive right or wrong answers to the exercise and are encouraged to respond with a wide range of ideas

Cont...

Disadvantages:

- The complexity of the data and the corresponding skills required of the researcher
- They are expensive to administer because highly skilled research staff have to be employed
- It is difficult to get the subjects to project themselves into the roles the researcher wish them to assume.