**METHODS OF RESEARCH DATA COLLECTION**

Ms. Vasudha, Ms. Simran, Ms. Khushboo Nesha Khatun

Akal College of Nursing, Eternal University, Baru Sahib

**ABSTRACT:**

The process of gathering and analysing accurate data from various sources to find answers to research problems, trends and probabilities, etc., to evaluate possible outcomes is known as Data Collection. Knowledge is power, information is knowledge, and data is information in digitized form, at least as defined in IT. Hence, data is power. But before you can leverage that data into a successful strategy for your organization or business, you need to gather it. Before we define what data, collection is, it’s essential to ask the question, “What is data?” The abridged answer is, data is various kinds of information formatted in a particular way. Therefore, data collection is the process of gathering, measuring, and analysing accurate data from a variety of relevant sources to find answers to research problems, answer questions, evaluate outcomes, and forecast trends and probabilities. Accurate data collection is necessary to make informed business decisions, ensure quality assurance, and keep research integrity. Data collection is the process of gathering, measuring, and analysing accurate data from a variety of relevant sources to find answers to research problems, answer questions, evaluate outcomes, and forecast trends and probabilities. Accurate data collection is necessary to make informed business decisions, ensure quality assurance, and keep research integrity.

**KEY TERMS:**

Data, Data Collection, Quantitative, Qualitative,

**INTRODUCTION:**

Managing clinical responsibility is a challenge for nurses and nursing profession. Nurses require extraordinary range of knowledge, skills, and talents to provide quality care to their patients. Nursing research generates new knowledge that boosts scientific practices and is the only valid knowledge that can rely upon in their practice. So, nurses need to be cognizant and proficient in research process.

Information collected from different research studies generally depends on various sources. However, a quality research study requires that highly reliable and valid data are collected. Therefore, diligence and application of the researcher can be of high importance. Sources of data collection in different research studies is largely depends on several factors, such as types of research study, phenomenon under study, purpose of the study, etc. However basically sources of data are generally categorized into two broad categories, namely primary and secondary data sources. A collection of information, statistics, objects, symbols, and events acquired from various sources is referred to as data. Organizations collect data using a variety of data collection methods in order to make better decisions. Organizations would find it difficult to make effective decisions without data, thus data is collected from various audiences at various instances in time.

For instance, before introducing a new product, a company needs to gather information on market demand, consumer preferences, and rivals. If data is not gathered in advance, the company's recently launched product may fail for a variety of reasons, including lower demand and an inability to satisfy client expectations.

A data set is a collection of information or statistics, facts, figures, general materials, evidence, or knowledge gathered during the course of a research project. It is a collection of facts and data intended for a specific purpose, such as a survey or study.

1. **CONCEPT OF DATA COLLECTION**

**Definition:**

Data collection is the process of gathering the desirable information carefully, with least possible distortion, so that the analysis may provide answers that are credible and stand to logic.

**Points to be considered:**

Before beginning with collecting data, following points need to be considered:

* Aim of research
* Type of data need to be collected
* Methods and procedures used to collect, store, and process the data.

**Steps:**

To collect high-quality data that is relevant to the purposes of the researcher, following steps need to be followed:

**STEP-1: DEFINE THE AIM OF YOUR RESEARCH:**

Before you start the process of data collection, you need to identify exactly what you want to achieve. You can start by writing a problem statement: what is the practical or scientific issue that you want to address and why does it matter?

Next, formulate one or more research questions that precisely define what you want to find out. Depending upon your research questions you might need to collect qualitative or quantitative data:

**Quantitative data:** Quantitative data is expressed in numbers and graphs and is analyzed using statistical procedures. For example, the height of a class's students, test scores, the amount of news pieces published on a topic, the number of times a specific term has been used in publications, and so on. Such data can be represented using ordinal and ratio scales, and they can be statistically assessed.

**Qualitative data**: Qualitative data is information that cannot be expressed numerically. Such information can only be expressed using nominal scales. For example, religion, gender, and so on. "Descriptions of situations, events, people, interactions, and observed behaviors; direct quotations from people and excerpts or entire passages from documents, correspondence, records, and case studies" (Patton, 1988) are also acceptable. Words are the finest way to convey qualitative data.

* If your aim is to test a **hypothesis,** measure something precisely, or gain large-scale statistical insights, collect quantitative data. If your aim is to explore ideas, understand experiences, or gain detailed insights into a specific context, collect qualitative data. If you have several aims you can use a mixed methods approach that collects both types of data.

**STEP-2: CHOOSE YOUR DATA COLLECTION METHOD:**

Based on the data you want to collect, decide which method is best suited for your research.

* Experimental research is primarily quantitative method.
* Interviews, focus groups & ethnographiesare qualitative method.
* Surveys, observations, archival research and secondary data collection can be qualitative or quantitative methods.

Carefully consider the methods used to gather data that helps directly answering research questions.

**Data collection methods:**

**Experiment:**

* When to use: to test causal relationship.
* How to collect data: manipulate variables and measure their effects on others.

**Survey:**

* When to use: to understand the general characteristics or opinions of a group of people.
* How to collect data: distribute a list of questions to a sample online, in-person or over the phone.

**Interview/focus group:**

* When to use: to gain in–depth understanding of perceptions and or opinions on topic
* How to collect: verbally ask participants open-ended questions in individual interview or focus group discussions.

**Observations:**

* When to use: to understand something in its natural setting
* How to collect data: measure or survey a sample without trying to affect them

**Ethnography:**

* When to use: to study the culture or community or organization first-hand.
* How to use: join and participate in a community and record your observations and reflections

**Archival research:**

When to use: to understand current or historical events, conditions or practices.

How to collect data: access manuscripts, documents or records from libraries, depositories or the internet.

**Secondary data collection:**

When to use: to analyse data from populations that you can’t access first-hand.

How to collect data: find existing datasheets that have already been collected, from sources such as government agencies or research organizations.

**STEP-3: PLAN YOUR DATA COLLECTION PROCEDURES:**

When you know which method you are using, you need to plan exactly how you will implement them. What procedures will you follow to make accurate observations or measurements of the variables you are taken in?

For instance, if you’re conducting an experiment, make decisions about your experimental design (e.g., determine the inclusion and exclusion criteria).

**Operationalisation:**

Sometimes your variables can be measured directly: for example, you can collect data on the average age of employees simply by asking for dates of birth. However, often you’ll be interested in collecting data on more abstract concepts or variables that can’t be directly observed.

[Operationalisation](https://www.scribbr.com/?p=161967) means turning abstract conceptual ideas into measurable observations. When planning how you will collect data, you need to translate the conceptual definition of what you want to study into the operational definition of what you will actually measure.

You operationalize this concept in two ways:

* You ask managers to rate their own leadership skills on 5-point scales assessing the ability to delegate, decisiveness and dependability.
* You ask their direct employees to provide anonymous feedback on the managers regarding the same topics.

**Sampling**

You may need to develop a[sampling](https://www.scribbr.com/methodology/sampling-methods/) plan to obtain data systematically. This involves defining a [population](https://www.scribbr.com/methodology/population-vs-sample/), the group you want to draw conclusions about, and a sample, the group you will actually collect data from.Your sampling method will determine how you recruit participants or obtain measurements for your study. To decide on a sampling method, you will need to consider factors like the required sample size, accessibility of the sample, and timeframe of the data collection.

**Standardizing procedures**

If multiple researchers are involved, write a detailed manual to standardize data collection procedures in your study.This means laying out specific step-by-step instructions so that everyone in your research team collects data in a consistent way – for example, by conducting experiments under the same conditions and using objective criteria to record and categorize observations. This helps you avoid common [research biases](https://www.scribbr.com/faq-category/research-bias/) like [omitted variable bias](https://www.scribbr.com/research-bias/omitted-variable-bias/) or [information bias](https://www.scribbr.com/research-bias/information-bias/).This helps ensure the [reliability](https://www.scribbr.com/methodology/types-of-reliability/) of your data, and you can also use it to replicate the study in the future.

**Creating a data management plan**

Before beginning data collection, you should also decide how you will organize and store your data.

* If you are collecting data from people, you will likely need to anonymize and safeguard the data to prevent leaks of sensitive information (e.g. names or identity numbers).
* If you are collecting data via interviews or pencil-and-paper formats, you will need to perform [transcriptions](https://www.scribbr.com/methodology/transcribe-interview/) or data entry in systematic ways to minimize distortion.
* You can prevent loss of data by having an organization system that is routinely backed up.

## STEP 4: COLLECT THE DATA

Finally, you can implement your chosen methods to measure or observe the variables you are interested in.Examples of collecting qualitative and quantitative data

* To collect data about perceptions of managers, you administer a survey with closed- and open-ended questions to a sample of 300 company employees across different departments and locations.

The closed-ended questions ask participants to rate their manager’s leadership skills on scales from 1–5. The data produced is numerical and can be statistically analyzed for averages and patterns.

The open-ended questions ask participants for examples of what the manager is doing well now and what they can do better in the future. The data produced is qualitative and can be categorized through [content analysis](https://www.scribbr.com/methodology/content-analysis/) for further insights.

To ensure that high quality data is recorded in a systematic way, here are some best practices:

* Record all relevant information as and when you obtain data. For example, note down whether or how lab equipment is recalibrated during an experimental study.
* Double-check manual data entry for errors.
* If you collect quantitative data, you can assess the [reliability and validity](https://www.scribbr.com/methodology/reliability-vs-validity/) to get an indication of your data quality.

1. **METHODS/TECHNIQUES OF DATA COLLECTION:**

**Types of Data:** Data is of two types-

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* **Qualitative Data:** These data represent certain features or attributes. They show observations that can be observed but are unable to be computed or calculated. For example, data on intelligence, honesty, wisdom, cleanliness, and creativity gathered from your class's students as a sample would be labeled as qualitative. They are exploratory rather than definitive in character.
* **Quantitative Data**: These can be measured rather than just observed. They can be quantitatively represented and used to conduct calculations. For example, data on the number of students in your class who participate in various sports provides an estimate of how many of the total pupils participate in particular sport. This data is numerical and can be categorized as quantitative.
* **PRIMARY DATA:**is collected from **first-hand experience** and is not used in the past. The data gathered by primary data collection methods are specific to the research’s motive and highly accurate.
* **SECONDARY DATA:** se**condary data is the data that has been used in the past**. The researcher can obtain data from the [data sources](https://www.questionpro.com/blog/data-source/), both internal and external, to the [organizational data](https://www.questionpro.com/blog/data-organization/).

1. **Techniques of data collection used in quantitative and qualitative research:**

# QUALITATIVE DATA COLLECTION:

In qualitative research, qualitative data collecting is critical. It aids researchers in understanding individuals' attitudes, beliefs, and behaviors in a given setting. Qualitative data is collected using a variety of approaches, including interviews, questionnaires, focus groups, and observations.

**1. INDIVIDUAL INTERVIEW:** Because of its methodology, it is one of the most trustworthy, extensively used, and familiar qualitative data collection procedures. An individual interview, often known as a face-to-face interview, is a direct dialogue between two persons that has a specified format and goal. The interview questionnaire is designed to elicit an interviewee's knowledge or perspective on a particular topic, program, or issue. Depending on the interviewer's style, the conversation can be unstructured or informal at times, but it should always be centered on learning the individual's beliefs, values, understandings, feelings, experiences, and opinions on a topic.

**Fundamental Interview Types in Research:**

**STRUCTURED INTERVIEW**: Structured interviews are research instruments that can be more flexible in their operations and allow for more or less urging of participants to acquire and analyze data. A standardized interview is another name for it.

They can be both closed and open-ended. Closed-ended inquiries can be used to elicit user preferences from a set of answer possibilities. Open-ended questions can be used to elicit information regarding a specific section of the interview.

**Examples of organized interviews:**

* Can you tell me about your experience working in customer service?
* How do you handle an irate or upset customer?
* How do you assure the accuracy of the information you provide to customers?

**Advantages:**

* It focuses on the correctness of various responses, allowing for the collection of well ordered data.
* The standardization provided by it simplifies the interview method.
* Because the structure of the interview is consistent, replication across numerous samples is simple.
* Because the structure of the interview is consistent, it frequently produces trustworthy results and is rapid to execute**.**

**Disadvantages**

* The limited scope of assessment of obtained results.
* The accuracy of information overpowers the detail of information.
* Respondents are forced to select from the provided answer options.
* The researcher is expected to always adhere to the list of decided questions, irrespective of how interesting the conversation is turning out to be with the participants.
* A significant amount of time is required for a structured interview.

**SEMI STRUCTURED INTERVIEW:** Semi-structured interviews offer a considerable amount of **leeway** to the researcher to probe the respondents, along with maintaining a basic interview structure.A researcher can be assured that multiple interview rounds will not be required in the presence of structure in this type of research interview.The best application of **semi-structured interview** is when researchers **don’t have enough time** to conduct research.

**A semi-structured interview question might look like this:**

* **Could you tell us about your marketing experience?**
* **What do you believe are the most significant components of a successful marketing campaign?**
* **Tell me about a campaign you're really proud of.**
* **How do you do market research and analyze data to make marketing decisions?**

**Advantages**: Semi-structured interview questions are provided ahead of time, providing the researcher time to prepare and analyze the questions.

* It is somewhat adaptable while adhering to the research requirements.
* Unlike in a structured interview, researchers can convey interview questions in the format of their choice.
* These interviews can provide reliable qualitative data.
* The interview's adaptable framework**.**

**Disadvantages:** Participants may question the reliability factor of these interviews due to the flexibility offered.

* Comparing two different answers becomes difficult as the guideline for conducting interviews is not entirely followed. No two questions will have the exact same structure, and the result will be an inability to compare is inferring results.

**UNSTRUCTURED INTERVIEW:** Also called [**in-depth interviews**](https://www.questionpro.com/blog/in-depth-interviews/), **unstructured interviews** are usually described as **conversations held with a purpose in mind**. These interviews have the **least number of questions** as they lean more towards a normal conversation but with an underlying subject.

To achieve the intended result, a researcher must consider the following factors: The interview's purpose.

* The interview should focus primarily on the participant's interests and skills.
* All conversations should take place within the research's permissible limitations, and the researcher should endeavour to adhere to these limits.
* The researcher's abilities and knowledge should be appropriate for the objective of the interview.
* Researchers should be aware of the dos and don'ts.

**Examples:**

* Can you tell me about a time when you had to cope with something difficult and how you dealt with it?
* What are some of your greatest accomplishments, and what have you learned from them?
* How do you deal with ambiguity or a lack of direction at work?
* Can you describe your leadership style and how you motivate your team?
* Can you tell me about a moment when you had to make a difficult decision and how you did so?

**Advantages:**

* Because of the informal character of this style of interview, it is exceedingly easy for researchers to try to build a friendly relationship with the participants. This results in extremely detailed insights without much conscious effort.
* The participants can clear up any questions they have about the questions, and the researcher can use every opportunity to explain his/her goal to provide better responses.
* There are no questions that the researcher must answer, which usually promotes the overall freedom of the study process.

**Disadvantages:**

* Because there is no structure to the interview process, researchers take their time doing these interviews.
* The lack of a standardized set of questions and rules implies that the dependability of the interview is doubtful.
* The ethics involved in these interviews are frequently regarded as distressing.

**Other Types of Interviews:**

1. Behavioural
2. Panel
3. Group
4. Case
5. Technical
6. Stress

**2.QUALITATIVE SURVEYS:** To develop an informed hypothesis, many researchers use qualitative research surveys for [data collection](https://www.questionpro.com/blog/data-collection/) or to collect a piece of detailed information about a product or an issue.

**PAPER SURVEY:** Paper surveys are frequently used for qualitative data collection from the participants. The survey consists of short text questions, which are often open-ended.These questions’ motive is to collect as much detailed information as possible in the respondents’ own words. More often, the survey questionnaires are designed to collect standardized data and hence used to collect responses from a larger population or large sample size.

**ONLINE SURVEY:** An [**online survey**](https://www.questionpro.com/blog/what-are-online-surveys/) or a web survey is prepared using a prominent online [survey software](https://www.questionpro.com/survey-software/) and either uploaded to a website or emailed to the selected sample size with the motive of collecting reliable online data.

**3. FOCUS GROUP DISCUSSION:** [Focus group](https://www.questionpro.com/blog/focus-group/) discussions can also be considered a type of interview, but it is conducted in a group discussion setting. Usually, the focus group consists of 8 – 10 people (the size may vary depending on the researcher’s requirement). The researchers ensure appropriate space is given to the participants to discuss a topic or issue in a context. The participants are allowed to either agree or disagree with each other’s comments.

**4. RECORD KEEPING:** As the data source, this method employs dependable documents and other existing sources of information. This information will be useful in the next study. It's similar to going to the library. There, you can sift through books and other sources to gather information for your research.

**5. CASE STUDIES:** This strategy collects data by closely examining case studies. The fact that this method may be used to evaluate both simple and complex topics demonstrates its adaptability. The strength of this method is how successfully it draws conclusions from a combination of one or more qualitative data collection methods.

**6.** **OBSERVATIONS:** Observation is a traditional method of gathering qualitative data. Researchers utilize it to collect descriptive analytical data by monitoring people and their behavior at events or in their natural environments. In this method, the researcher is entirely absorbed in watching individuals and taking notes by taking a participatory position.

**QUANTITATIVE DATA COLLECTION:**

## METHODS FOR QUANTITATIVE DATA COLLECTION:

**1.PROBABILITY SAMPLING:**A definitive method of sampling carried out by utilizing some form of **random selection** and enabling researchers to make a probability statement based on data collected at random from the targeted demographic. One of the best things about [probability sampling](https://www.questionpro.com/blog/probability-sampling/) is it allows researchers to collect the data from representatives of the population they are interested in studying.

Probability sampling can be **simple random sampling, cluster sampling, systematic sampling, stratified sampling.**

**2.INTERVIEW:** Interviewing people is a standard method used for [data collection](https://www.questionpro.com/blog/data-collection/). However, the interviews conducted to collect quantitative data are more structured, wherein the researchers ask only a standard set of [online questionnaires](https://www.questionpro.com/blog/online-questionnaire/) and nothing more than that.

**Three major**[**types of interviews**](https://www.questionpro.com/blog/types-of-interviews/)**:**

* **Telephone interviews:** For years, telephone interviews ruled the charts of data collection methods. Nowadays, there is a significant rise in conducting video interviews using the internet, Skype, or similar online video calling platforms.
* **Face-to-face interviews:**It is a proven technique to collect data directly from the participants. It helps in acquiring quality data as it provides a scope to ask detailed questions and probing further to collect rich and informative data.
* **Computer-Assisted Personal Interviewing (CAPI):** It is nothing but a similar setup of the face-to-face interview where the interviewer carries a desktop or laptop along with him at the time of interview to upload the data obtained from the interview directly into the database.

**3. SURVEYS / QUESTIONNAIRES:** Surveys or [questionnaires](https://www.questionpro.com/blog/what-is-a-questionnaire/) created using online survey software are playing a pivotal role in online data collection is quantitative or qualitative research. The surveys are designed in a manner to legitimize the behavior and trust of the respondents.

**Two significant types of survey questionnaires** used to collect online data for quantitative market research. **Web-based questionnaire**: This is one of the rulings and most trusted methods for internet-based research or online research. In a web-based questionnaire, the receive an email containing the survey link, clicking on which takes the respondent to a secure online survey tool from where he/she can take the survey or fill in the survey questionnaire.

* **Mail Questionnaire:** In a mail questionnaire, the survey is mailed out to a host of the sample population, enabling the researcher to connect with a wide range of audiences. The mail questionnaire typically consists of a packet containing a cover sheet that introduces the audience about the type of research and reason why it is being conducted along with a prepaid return to collect data online.

**4. OBSERVATIONS:** As the name suggests, it is a pretty simple and straightforward method of collecting quantitative data. In this method, researchers collect quantitative data through systematic observations by using techniques like counting the number of people present at the specific event at a particular time and a particular venue or number of people attending the event in a designated place.

Structured observation is more used to collect quantitative rather than [**qualitative data collection**](https://www.questionpro.com/blog/qualitative-data-collection-methods/)**.**

* **Structured observation:** In this type of observation method, the researcher has to make careful observations of one or more specific behaviours in a more comprehensive or structured setting compared to naturalistic or [participant observation](https://www.questionpro.com/blog/participant-observation/). In a structured observation, the researchers, rather than observing everything, focus only on very specific behaviours of interest. It allows them to quantify the behaviours they are observing.

**DOCUMENT REVIEW IN QUANTITATIVE DATA COLLECTION:** Document review is a process used to collect data after reviewing the existing documents. It is an efficient and effective way of gathering data as documents are manageable. Those are the practical resource to get qualified data from the past.

**Three primary document types:**

* **Public Records:** Under this document review, official, ongoing records of an organization are analysed for further research. For example, annual reports policy manuals, student activities, game activities in the university, etc.
* **Personal Documents:** In contrast to public documents, this type of document review deals with individual personal accounts of individuals’ actions, behaviour, health, physique, etc. For example, the height and weight of the students, distance students are travelling to attend the school, etc.
* **Physical Evidence:**Physical evidence or physical documents deal with previous achievements of an individual or of an organization in terms of monetary and scalable growth

**CLASSIFICATION OF DATA COLLECTION SOURCES:**

**Data Sources:** A data sources is location where data that is being used originates from.

**1. Primary data sources:** Primary data is data that has been acquired from its original source. Primary data, which has not yet been published, is more reliable, authentic, and objective. Surveys, questionnaires, interviews, and observations, are the examples of primary data source.

**Advantages**

* Data interpretation is better.
* Targeted issues are addressed.
* Efficient spending for information.
* Decency of data.
* Greater control.

**Disadvantages**

* High cost.
* Time consuming process.
* More number of resources is required.

**2. Secondary data sources:** Secondary data sources data that has been already collected by and readily available from other sources other than original one. e.g published printed sources, books, journals, magazines, published electronic sources, e-journals, general websites, weblogs.

It is further divided into: **Internal sources:** internal sources of secondary data are usually for marketing application. For example: sales records, marketing activity, cost information, distributors reports, customer feedback. **External sources:** External sources data are usually for financial application. It can be:

* **Published printed sources**: books, journals, magazines,
* **Published electronic sources:** e-journals, general websites, weblogs.

**Advantages:**

* Inexpensive
* Easily accessible
* Will provide essential background and help to clarify or refine research problem
* It will provide research method alternatives.
* It will also alert the researcher to any potential difficulties.

**Disadvantages:**

* Provide incomplete information.
* Not specific to researcher.
* It doesn’t provide quality data.

**STEPS IN QUNTITATIVE RESEARCH**

**Settings where nurses work**

* Justice settings
* Schools
* Homes
* Worlplaces
* Long-Term care facilities
* Clinics
* Hospitals
* Justice settings
* Health equlity
* Social determinants of health
* Population and community health
* System and models of care
* Prevention and health promotion

**conclusion:** the collection of data is the heart of any research design, irrespective of the field of study. Any research begins with certain questions, which need to be answered. Data collection is a systematic process of gathering observations or measurements and it allows the researcher to gain firsthand knowledge and original insights into the research problem

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