**METHODS OF RESEARCH DATA COLLECTION**

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**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. Data is a collection of facts, figures, objects, symbols, and events gathered from different sources. Organizations collect data with various data collection methods to make better decisions. Without data, it would be difficult for organizations to make appropriate decisions, so data is collected from different audiences at various points in time.

For instance, an organization must collect data on product demand, customer preferences, and competitors before launching a new product. If data is not collected beforehand, the organization’s newly launched product may fail for many reasons, such as less demand and inability to meet customer needs. Data is a unit of information or any statistics, facts, figures general materials, evidence or knowledge collected during the course of the study. It is a collection of facts and figures to be used for a specific purpose such as a survey or analysis.

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:**

Beforeyoustart 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:** Qualitative data is expressed in number and graphs and is analyzed through statistical methods. For example, height of students of a class, marks obtained in a test, number of news stories published on a topic, number of times a particular word has been used in publications, etc. It is feasible to represent such data through ordinal and ratio scales, and are capable of being statistically evaluated.

**Qualitative data:** The data that cannot be expressed in the form of a number is qualitative data. Such data can only be expressed through nominal scales. For example, religion, gender, etc.

It can also be “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). Qualitative data can be best conveyed in the form of words.

* 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:**They represent some characteristics or attributes. They depict descriptions that may be observed but cannot be computed or calculated. For example, data on attributes such as [intelligence](https://www.toppr.com/guides/business-correspondence-and-reporting/communication/interpersonal-skills-listening-skills-and-emotional-intelligence/), [honesty](https://www.toppr.com/guides/essays/essay-on-honesty-is-the-best-policy/), wisdom, cleanliness, and creativity collected using the students of your class a sample would be classified as qualitative. They are more exploratory than conclusive in nature.
* **Quantitative Data:**These can be measured and not simply observed. They can be numerically represented and calculations can be performed on them. For example, data on the number of students playing different [sports](https://www.toppr.com/guides/general-knowledge/sports-and-games-of-india-and-world/games-of-india/) from your class gives an estimate of how many of the total students play which sport. This information is numerical and can be classified 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:

Qualitative data collection is vital in qualitative research. It helps researchers **understand** individuals’ **attitudes, beliefs, and behaviors** in a specific context. Several **methods** are used to collect qualitative data, including **interviews, surveys, focus groups**, and **observations**.

**1.INDIVIDUAL INTERVIEW:** It is one of the most trusted, widely used, and familiar qualitative data collection methods primarily because of its approach. An individual or **face-to-face interview** is a direct conversation between two people with a specific structure and purpose. The [**interview questionnaire**](https://www.questionpro.com/blog/interview-questions/) is designed in the manner to elicit the interviewee’s knowledge or perspective related to a topic, program, or issue. At times, depending on the interviewer’s approach, the conversation can be **unstructured or informal** but focused on understanding the individual’s beliefs, values, understandings, feelings, experiences, and perspectives on an issue.

## Fundamental Types of Interviews in Research:

**STRUCTURED INTERVIEW:** Structured interviews are defined as **research tools** that could be more **flexible** in their operations are allows more or no scope of prompting the participants to obtain and analyse results. It is also known as a **standardized interview**.

They can be **closed-ended and open-ended**. **Closed-ended questions** can be included to understand user preferences from a collection of answer options. **Open-ended** ones can be included to **gain details** about a particular section in the interview.

**Examples of structured interview:**

* Can you talk about what it was like to work in customer service?
* How do you deal with an angry or upset customer?
* How do you ensure that the information you give customers is correct?

**Advantages** It focuses on the accuracy of different responses, due to which extremely organized data can be collected.

* The interview procedure is made easy due to the standardization offered by it.
* Replication across multiple samples becomes easy due to the same structure of the interview.
* Since the structure of the interview is fixed, it often generates reliable results and is quick 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.

**Example of a semi-structured interview question:**

* Can you tell us about the marketing work you’ve done?
* What do you think are the most important parts of a marketing campaign that works?
* Tell me about a campaign you worked on that you’re very proud of.
* How do you do research on the market and look at data to help you make marketing decisions?

**Advantages:** Questions from semi-structured interview questions are prepared before the scheduled interview, giving the researcher time to prepare and analyse the questions.

* It is flexible to an extent while maintaining the research guidelines.
* Unlike a structured interview, researchers can express the interview questions in the preferred format.
* Reliable [qualitative data](https://www.questionpro.com/blog/qualitative-data/) can be collected via these interviews.
* The flexible structure of the interview.

**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.

**For a researcher to obtain the desired outcome, he/she must keep the following factors in mind:** The intent of the interview.

* The interview should primarily take into consideration the participant’s interests and skills.
* All the conversations should be conducted within the permissible limits of research, and the researcher should try and stick by these limits.
* The researcher’s skills and knowledge should match the interview’s purpose.
* Researchers should understand the dos and don’ts of it.

**Examples of unstructured interview:**

* Can you tell me about when you had to deal with something hard and how you did it?
* What are some of the things you’re most proud of, and what did you learn from them?
* How do you deal with ambiguity or not knowing what to do at work?
* Can you describe how you lead and how you get your team going?
* Can you tell me about a time when you had to make a hard choice and how you made that choice?

**Advantages of unstructured interview:**

* Due to this type of interview’s informal nature, it becomes extremely easy for researchers to try and develop a friendly rapport with the participants. This leads to gaining insights in extreme detail without much conscious effort.
* The participants can clarify all their doubts about the questions, and the researcher can take each opportunity to explain his/her intention for better answers.
* There are no questions that the researcher has to abide by, and this usually increases the flexibility of the entire research process.

**Disadvantages of unstructured interview:**

* Researchers take time to execute these interviews because there is no structure to the interview process.
* The absence of a standardized set of questions and guidelines indicates that its reliability of it is questionable.
* The ethics involved in these interviews are often considered borderline upsetting.

**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:** This method uses reliable documents and other sources of information that already exist as the data source. This information can help with the new study. It’s a lot like going to the library. There, you can look through books and other sources to find information that can be used in your research.

**5.CASE STUDIES:** In this method, data is collected by looking at case studies in detail. This method’s flexibility is shown by the fact that it can be used to analyze both simple and complicated topics. This method’s strength is how well it draws conclusions from a mix of one or more qualitative data collection methods.

**OBSERVATIONS:** [Observation](https://www.questionpro.com/blog/qualitative-observation/) is one of the traditional methods of qualitative data collection. It is used by researchers to gather [descriptive analysis](https://www.questionpro.com/blog/descriptive-analysis/) data by observing people and their behavior at events or in their natural settings. In this method, the researcher is completely immersed in watching people by taking a participatory stance to take down notes

# 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 traveling 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 means original data that has been collected from original source. primary data has not been published yet and is more reliable, authentic and objective. e.g survey, questionnaire, interview, observation etc.

**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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