METHODOLOGY IN NURSING RESEARCH

Abstract

Research is an essential part for the growth of any profession in today's world. Nursing research is a systemic inquiry to answer the question or problems encountered in the clinical practice, education and administration (Polit & Beck, 2008). Research studies have great importance in nursing profession because it provides strong evidence that help nurses to make sound clinical decision and judgment in the clinical setting; it helps to give evidence-based nursing care to the patient that would be clinically appropriate, cost effective and result in positive outcome of patient. Therefore, nurses are expected to understand and conduct research in their field. This paper illustrates the methodology, sampling techniques and methods of analysis of data used in nursing research.

Keyword: methodology, research, sampling, analysis methods

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I. WHAT IS RESEARCH METHODOLOGY?

Research methodology refers to the precise procedures or techniques applied to the selection, collection, organisation, and analysis of data relevant to a topic. A research paper's methodology section offers the reader the option to evaluate the study's general validity and dependability.

For instance, how did the researcher decide,

1. What Information to gather
2. Who to gather it from
3. How to collect data
4. Data analysis methods, which describe how to analyse it.

II. DEFINITION

Research can be defined as "an activity that involves finding out, in a more or less systematic way, things you did not know"

Walliman and Walliman,2011

"Methodology is the philosophical framework within which the research is conducted or the foundation upon which the research is based"

Brown, 2006

III. IMPORTANCE OF RESEARCH METHODOLOGY

A research-based methodology gives the study legitimacy and produces valid scientific findings. Additionally, it provides a complete method that assists in maintaining researchers' focus and enables a straightforward, effective, and manageable approach. By comprehending the researcher's methodology, the reader may be able to grasp the approach and techniques used to arrive at results.

The following are some benefits of employing a trustworthy research methodology:

1. The study has enough documentation to allow for replication by other researchers.
2. If their techniques are criticised, researchers can utilise the methodology to support them.
3. It can aid in providing researchers with a precise plan to follow throughout their investigation.
4. With the assistance of the methodology design process, researchers may select the appropriate techniques for their objectives.
5. It enables researchers to specify their study's goals in detail right away.

IV. TYPES OF RESEARCH METHODOLOGY

Choosing a research approach requires a researcher to consider a number of options. The choice of whether to use qualitative, quantitative, or a combination of the two data techniques is one of the most important choices. Researchers can choose to focus on

obtaining words, numbers, or both types of data, but the information they receive will always be in the form of numbers or descriptions.

The following are different methodologies used in research:

1. **Qualitative research:** A rigorous, objective, and systematic method of learning about the world is quantitative research. To characterise novel conditions, events, or concepts, quantitative research is undertaken. In a quantitative research project, the researcher preselects and defines the variables, collects and quantifies the data, and then statistically analyses it often with the goal of determining the cause-and-effect relationships between the variables. In a research subject where variables are often addressed in numerical (quantitative) form, this procedure offers an organised way to approach the issue. The identification and formulation of the research problem is the first step in the research process, which concludes with the dissemination of research findings.
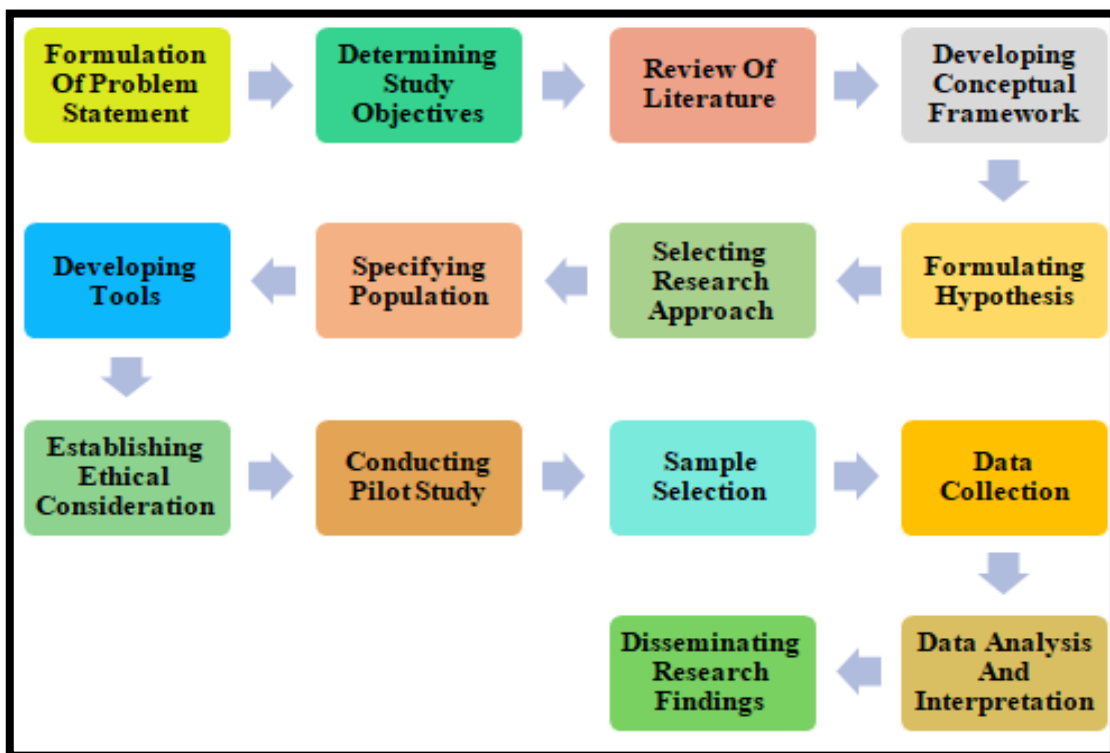
2. **Qualitative research:** Qualitative research is a systematic and evaluative way to explain things and give them the intended meanings. It is a field that crosses boundaries across disciplines and sometimes even runs opposed to them. The naturalistic viewpoint and interpretive comprehension of human experiences are important to it. The exploration of attitude, emotions, beliefs, delicate topics, ideas, concepts, processes, and interpersonal interactions is also helpful in revealing concealed truths. Planning and research execution go hand in hand with the somewhat less formally organised qualitative research procedure. As a result, the steps involved in qualitative research differ slightly from those involved in quantitative research.
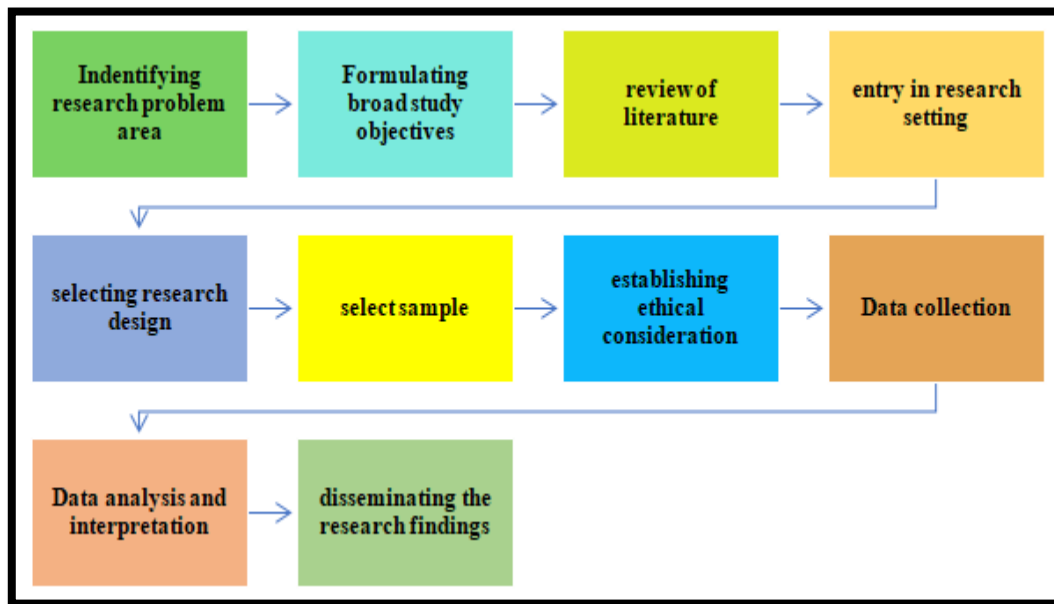
3. **Mixed-method:** Without recognising it, researchers have consistently adopted mixed method research methodologies in all fields of study. Mixed method research designs, however, have methodologically advanced over the past 20 years and are now acknowledged as a methodical technique to studying a complicated topic. Numerous complicated phenomena are addressed in nursing research, and neither quantitative nor qualitative research techniques are sufficient to provide comprehensive answers. As a result, there has been an increase in the use of mixed method research in nursing.
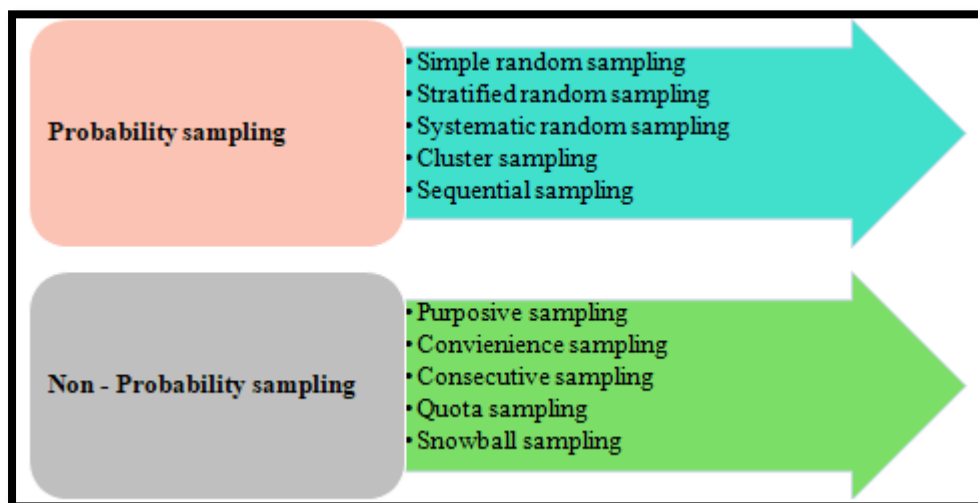
Mixed method research is an integrated approach to answer a research question, where quantitative and qualitative research methods are mixed at data collection, data analysis and data interpretation to obtain better understanding of phenomenon and to provide a complete answer to a research question than either approach alone'. Following are the uses of mixed method research designs:

- In mixed method research, quantitative and qualitative research act as supplementary and complimentary to each other for overcoming the weakness of one by using other in combination.
- Mixed method researches are helpful in enhancing comprehensiveness and completeness of a study results.
- Mixed method research provides better understanding and explanation for unexpected study results generated with quantitative and qualitative method alone.
- Mixed method research also helps in instrument and taxonomy/theory development.
- Mixed method research improves the credibility and usefulness of the data.

V. TYPES OF SAMPLING DESIGN IN RESEARCH METHODOLOGY

The process of picking a representative subset of the population is called sampling. As a result, a correctly executed sampling procedure aids in the creation of a sample that accurately captures the traits of the population from which it is derived. Although there are many different sampling procedures, they may be broadly divided into two categories:

1. **Probability sampling:** This sampling technique employs a randomly chosen sample from the population and is based on the theory of probability. There is an equal probability that any given person or thing in the population will be chosen. To improve the representativeness of the chosen sample for a study, probability sampling is utilised. Because individuals are chosen at random, the likelihood of systematic bias is quite low when using probability sampling approaches.

2. **Nonprobability sampling:** Nonprobability sampling is not random since the researcher chooses specifically certain subjects or things to include in the sample. Not every individual or object in the population has an equal probability of getting chosen. A technique known as non-probability sampling involves selecting samples in a way that does not offer each member of the population an equal chance of being chosen. In other words, when items are picked using non-random sample approaches, not every topic in this sort of sampling has an equal probability of being chosen.

Probability sampling
- Simple random sampling
- Stratified random sampling
- Systematic random sampling
- Cluster sampling
- Sequential sampling

Non - Probability sampling
- Purposive sampling
- Convienience sampling
- Consecutive sampling
- Quota sampling
- Snowball sampling

VI. COMMON DATA COLLECTION METHODS

Once a researcher has selected their demographic sample, they must decide how to collect data. The technique, data type, population sample, and study subject will all affect which research strategy is most appropriate. There are several options for acquiring data. Although there are many methods for gathering data, they are occasionally categorised in the following ways:

1. **Interviews**: Researchers might conduct interviews in a structured, semi-structured, or unstructured way depending on how formal the questions are.

2. **Surveys**: You may respond to surveys in person or online, and they can have closed-ended, multiple-choice questions or open-ended, essay-style questions. Depending on the information required, a survey could also utilise a combination.

3. **Focus groups:** Participants in focus groups are invited to express their thoughts, opinions, and perceptions on specific topics. The dialogue is usually facilitated by a moderator who makes sure everyone gets a chance to speak.

4. **Records and documents:** Researchers gather information from official papers from governments, businesses, and international organisations as well as from internal records like payroll, raw material costs, and cash transactions. They also collect information from public publications.

VII. COMMON DATA ANALYSIS METHODS

Depending on whether a set of information (data) is qualitative or quantitative, researchers will apply a different method of analysis.

For example: Qualitative data analysis The most typical types of qualitative data include written or spoken material, such as interview transcripts, video and audio recordings, notes, images, and text documents. In order to achieve the goals and objectives of the research, qualitative data analysis requires identifying common patterns in participant responses and critically analysing them.

The most popular techniques for analysing qualitative data are:

1. **Content analysis:** It is the most popular techniques for analyzing written data is typically used to examine interviewee replies.

2. **Narrative analysis:** This method is employed by researchers to examine data from a variety of sources, including surveys, observations, and interviews. It places a strong focus on using real-world examples and stories to shed light on research challenges.

3. **Discourse analysis:** This method focuses on understanding how individuals use language in social circumstances by analysing spoken or written language.

4. **Grounded theory:** This approach develops or refines a hypothesis explaining why something occurred using qualitative data. In order to arrive at explanations, it compares data from examples with comparable characteristics in other contexts.

VIII. QUANTITATIVE DATA ANALYSIS

Through the use of logic and critical thinking, numbers are transformed into meaningful data in quantitative data analysis. The majority of researchers use analytical software to aid in the analysis of quantitative data. Validating, editing, and coding the data is the initial step in the analysis of quantitative data. Once it's completed the data can be analyzed.

Typical techniques for analysing quantitative data include:

- **Descriptive analysis:** This technique makes use of statistical terms like mean, median, mode, percentage, frequency, and range to describe data.

- **Inferential analysis:** This technique uses correlation, regression, and variance analysis to reveal the connections between several variables.

IX. CONSIDERATIONS FOR SELECTING A RESEARCH METHODOLOGY

1. **The research objective:** Take the objective of your study project into consideration. Researchers are better able to choose the appropriate methodology and research approach when they are aware of the data, they will need at the project's conclusion to achieve their goals.

2. **Statistics' significance:** Another thing to think about is whether you need succinct, data-driven study findings and statistical solutions. Or whether knowledge of causes, perceptions, attitudes, and motives is necessary to answer the study questions.

3. **Research's nature:** If the project has exploratory aims and objectives, qualitative data collection methods will certainly be employed. However, if the study's goals and objectives are to assess or test anything, quantitative data collection methods will be required.

4. **Sample size:** How large of a sample must be drawn in order to sufficiently answer the objectives and research questions? The sample size may have an impact on your data collecting methods; it says whether to conduct in-person interviews for smaller samples or online surveys for larger ones.

5. **Time available:** If there are time restrictions, take into account methods like convenience or random sampling as well as instruments that enable data collecting in a matter of days. In-person interviews and observations are options for data collecting if there is more time available.

X. STEPS OF RESEARCH METHODOLOGY

A researcher must do a number of closely connected tasks as part of the research process. The research process needs participants. No measure exists to demonstrate that your study is the best. It is an art rather than science. Following are the research steps to be followed while writing methodology.
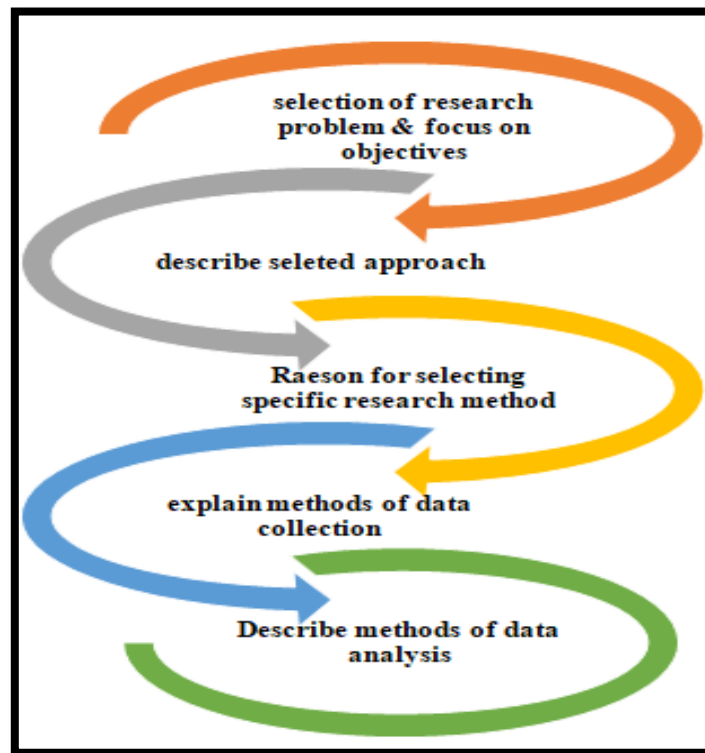
Step 1: Selection of research problem & focus on objectives: It could be difficult to decide on a research topic. Once we have selected a title or research statement, the rest of the activities will be straightforward. Therefore, in order to properly comprehend the problem, it is vital to talk about it with friends, co-workers, specialists, and teachers. The problem or subject of the research should be current, justifiable, ethically right, and of moderate importance. The methodology section should make it apparent why your methods are appropriate for your goals and convince the reader that you choose your strategy wisely in order to address your research problem and study questions.

Step 2: Describe selected approach: A good research method includes all the elements necessary to persuade the reader that the study under consideration is both useful and worthwhile. Studies are often carried out utilising either quantitative research methodologies or qualitative research methods. Quantitative research will be utilised when your goal is to analyse the relationship between the variables; qualitative research will be used when your objective is to evaluate real-world awareness of a specific group of people's attitudes, social dynamics, and shared values.

Step 3: Reason for selecting specific research design: Once you've made the decision to choose a research method, you must explain why you did so and how it relates to achieving the goals of your study.

Step 4: Explain methods of data collection: When drafting the methodology, keep in mind the intended number of readers. Consider the kinds of data you can get and how it could be feasible. Data collection is considered to be the process of gathering information from pertinent sources in order to address research questions, test hypotheses, and assess results. They typically fall into one of two categories: primary data or secondary data. Basically, surveying and interviewing are used to get primary data, whereas previously published

articles, reports, case studies, etc. are used to gather secondary data. Depending on the study methodology you have chosen, you can select either a primary or secondary data gathering strategy.

Step 5: Describe methods of data analysis: The tools that may be used to examine the data obtained must be determined once the data gathering method has been fixed. If the study is quantitative in nature, researcher must do statistical analysis utilising programmes like SPSS, Stata, or R, among others, to run statistical tests like the descriptive and inferential statistics such as two-tailed t-test, basic linear regression, correlation analysis, and so on. In contrast, words, images, and conclusions (typically incorporating some sort of textual interpretation) will all be part of the analysis in qualitative research. The three types of analysis are discourse analysis, content analysis, and thematic analysis.

XI. WHAT MAKES A GOOD METHODOLOGY?

A good research approach should include
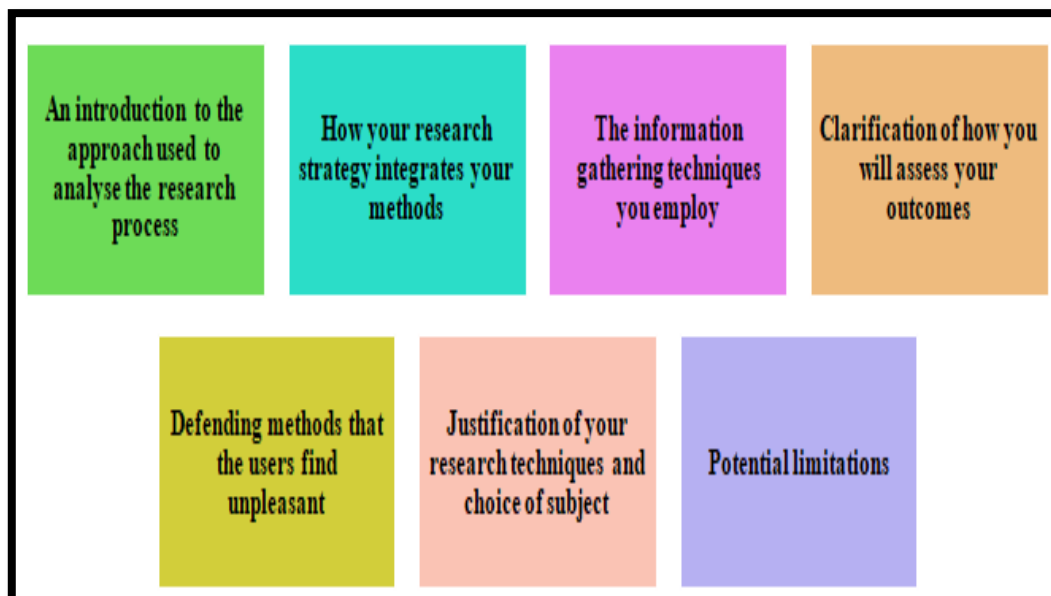
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