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Nursing Research & Statistics

Highlights

- **All inclusive guide to Nursing Research and statistics.**
- **Step by step research methodologies covered.**
- **Focus on evidence based practice.**
- **Practical applications and examples included.**

As per the Revised INC Syllabus

Rajesh Kumar

3rd Edition

JAYPEE

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7 Research Approaches and Designs

LEARNING OBJECTIVES

After reading this, you should be able to do the following:

- Define the concept of research approach and designs.
- Discuss the characteristics of a good research design.
- Components of research design.
- Selection of research design.
- Understand the concept of the internal and external validity of research design.
- Discuss the types of research design in nursing.
- Discuss various quantitative, qualitative, and mixed-method research designs.
- Discuss salient features and various types of theories.
- Demonstrate skills in planning and conducting systematic reviews and meta-analyses of RCTs and other study designs.

INTRODUCTION

Research and common sense both attempt to understand the perspectives of a phenomenon. However, research is not common sense and involves an explicit, systematic, and organized approach to finding solutions to the problem. Systematic research always begins with a specific research question followed by many subsequent steps to find the solution to the problem. The design selection in a research study will enable decision types of information collected to address the research question. Research design is a master plan specifying the plan and procedures for collecting and analyzing the information. It works as a blueprint for conducting a research study.

The words approach and design are used interchangeably among nursing scholars; however, a research design is a formal plan to guide the research process, and approach is the way we look, approach, and tackle the problem. In addition, a research design is a way we plan, arrange, organize, and sequence the things in the research process. Furthermore, a research approach is a broad aspect under which many research designs are possible. A researcher may choose qualitative, quantitative, and mixed-method approaches to answer a research question. The selection of the research approach enables the researcher to decide on certain methodological aspects for the study, i.e., design, sample size, data collection strategy, and type of statistical application.

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Research design is a plan of how, when, and where the information will be collected and analyzed. It is a methodology for addressing research questions or hypotheses that need to answer. The research design is an organized and integrated planning that guides the researcher in formulating, implementing, and controlling the study. Research design includes descriptions of the research approach, variables in the study, population and sampling criteria, method of data collection, and plan for data analysis. Therefore, a researcher should have a sound understanding and practical reason to choose a particular research design for the study.

Definitions

Research design is an overall plan for obtaining answers to the research questions or for testing the hypotheses. It is a master plan specifying the methods and procedures for collecting and analyzing the information to address a research question.

It is a blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings. BURNS AND GROVE, 2003

It is a plan that describes how, when, and where data are to be collected and analyzed. PARAHOO, 1997

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. SELLTIZ C ET AL, 1962

Research design is researcher's overall for answering the research question or testing the research hypothesis. POLIT ET AL. 2001

The research design is a master plan that specifies the methods and procedures for collecting and analyzing the information to address research questions or test hypotheses.

CHARACTERISTICS OF A GOOD RESEARCH DESIGN

A research design is a master plan specifying the methods and procedures for collecting and analyzing the needed information in research work. The followings are the important characteristics of a good research design:

- The selected design should be appropriate to the nature and objective of the phenomenon under study.
- It should be economical, considering the available time, money, and other feasibility aspects for the research works.
- A good research design should be flexible enough to include all the considerations in the research plan during the course of the study.
- The selection of a research design will guide the objective selection of methods and procedures for collecting and analyzing the needed information in a research study.
- A sound and appropriate research design should control external influences and minimize bias resulting in more empirical research findings.
- An appropriate selection of research design works as a guiding template for estimating sample size and selecting appropriate statistical tests for analyzing the findings.
- The research based on sound research design ensures the generalization of the findings.

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COMPONENTS OF RESEARCH DESIGN (FIG 7.1)

Research design is the *master plan* for a research study specifying the methods and procedures for collecting and analyzing the information in a research study. Nursing students and scholars often use the term *methodology* to describe and understand the word research design. Scholars and students are often expected to develop a crystal transparent methodology in the research study. The following are essential components of the research methodology:

Research Approach

The research approach is an important element of research design that outlines the investigation to study a phenomenon. Research approaches may be quantitative, qualitative, or a combination of both (mixed-method) approaches in a research study. The selection of the research approach determines some of the critical elements of the research study, i.e., the presence of a control/comparison group, randomization or manipulation, methods of data collection and analysis, and selection of statistical tests. The selection of the research approach depends on the types of research questions, hypotheses, and nature of the phenomenon under study.

Research Participants and Review of Literature

Research design gives a detailed description of the participants of the research study. For example, a researcher is interested in exploring the in-depth experiences of the patients living with HIV/AIDS in a community; here, the participants would be HIV/AIDS patients living with the disease conditions with a defined duration to give detailed narratives on the life experiences. Reviewing the literature will support the selection and decision on different aspects of the research design, including participants and sampling criteria.

Population, Sample, and Sampling Approach

Research design also determines the population, sample, and sampling technique used for the research study. For example, a phenomenological qualitative research design on the

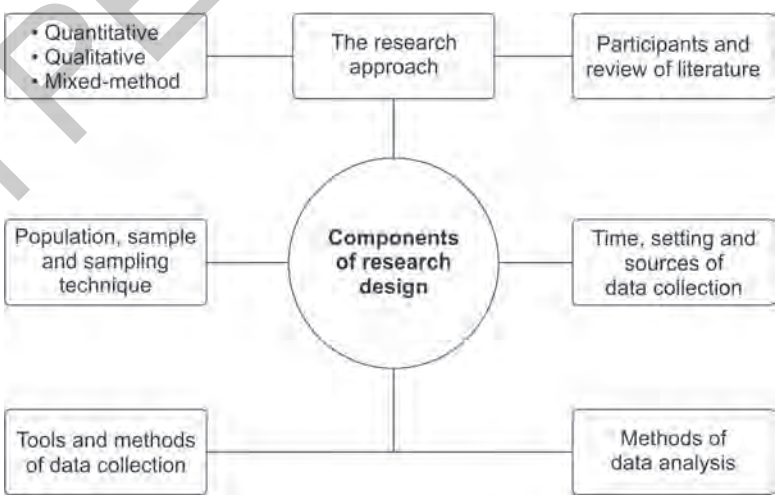

Fig. 7.1: Components of research design.

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living experiences of the survivors of the Bhopal gas tragedy gives the direction that the population will be survivors of the Bhopal gas tragedy and be small in size and selected using a purposive sampling technique.

The Time, Setting, and Sources of Data Collection

Research design clearly mentions about the time duration (days, weeks, months, or years), site, and setting (location) to conduct the study. Further, it describes the sources of the information to answer the research questions or test hypotheses.

Tools and Methods of Data Collection

Research design details the tools and methods used to conduct and collect the necessary information from the participants. For example, the use of checklists, rating scales, and questionnaires is largely preferred to collect quantitative information, which can be processed efficiently and quickly. In contrast, observations and interview methods are commonly used for the in-depth study of a phenomenon.

Methods of Data Analysis

Research design outlines the tentative plan of data analysis methods and statistical tests to be applied while analyzing the findings. Further, data analysis methods also determine the types of information collected to address the research question. A formal data analysis plan will help the researcher focus on relevant information and avoid wasting time and money.

SELECTION OF RESEARCH DESIGN

Research design is a formal plan that outlines the research process and specifies the methods and procedures to collect the information and devise a data analysis plan. The selection of an appropriate research design will direct the research process and avoid confusion and bias in a research study. However, the selection of research design largely depends on the nature of the phenomenon under study, the research question, available resources (i.e., time, money, workforce, ethical issues, availability of the participants, etc.), and the researcher's experiences. Some of the critical factors that determine the selection of research design are as follows:

Factors Affecting Selection of Research Design

The important factors which may determine the selection of research design are given below:

- **Nature of research problem:** This is the most fundamental aspect that affects the research design selection. The nature of the research problem determines the type of research design, whether it should be studied through qualitative or quantitative, or mixed method design. For example, a researcher is interested in exploring the factors associated with HIV/AIDS among substance abusers in a selected community setting. In this case, the researcher knows that the quantitative research design is most suitable for exploring the factors.
- **Purpose of the study:** The selection of the research design largely depends on the purpose of the study. For example, a researcher is interested in studying the effect of reminiscence therapy on depression among patients with depression. In this case, it is indicated that

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research is conducted to predict the effect of therapy on disease conditions, and choosing an experimental study design will best serve the purpose.

- **Availability of scientific information:** The availability of scientific information on the problem will determine the selection of the research design. For example, a researcher is interested in exploring the nurses' experiences working on COVID-19. In this instance, it is a notion that there is not much scientific literature available in this area, and choosing a suitable qualitative research design will enable us to provide a details understanding of the phenomenon under study.
- **Knowledge and experience of the researcher:** The researcher's experience and knowledge largely determine the selection of research design to study a phenomenon. It has been commonly observed that a researcher good in a particular research design always shows interest in carrying out similar studies. For example, a researcher with sound knowledge and vivid experience of qualitative research always chooses qualitative research design and vice-versa.
- **Interest and motivation of researcher:** Interest and motivation are subjective elements of a researcher that may influence the selection of a research design. A motivated and research-oriented mind always proactively plans to deal with a research design's intricacies before selecting it to complete the study on or before time. In contrast, a casual and callous attitude in selecting a research design may lead to confusion and result in failure.
- **Ethical and legal considerations:** This is another important factor that may influence the selection of the research design. A researcher must be aware of ethical principles, such as beneficence, maleficence, informed consent, privacy, and confidentiality and should select the research design under the purview of ethical principles to avoid any pitfalls in the later stage. For example, suppose a researcher is interested in choosing an experimental research design to investigate a phenomenon. In that case, he should look at the ethical guidelines and principles before selecting the design to avoid any hurdles in the later stage.
- **Research resources:** A researcher may need different kinds of resources, such as man, material, money, and other technical resources, to address a research problem. The need for resources may vary from one design to another and is primarily influenced by many associated research factors, such as sample size, duration, and study design. For example, planning and executing randomized controlled trials required extra resources than other non-experimental designs. Therefore, sometimes lack of resources may impede the selection of better designs and force the researchers to negotiate with alternative low-cost designs.
- **Participants/study subjects:** The type and availability of the research participants are other important elements that may influence the research design selection. For example, suppose a researcher is interested in a quantitative study but has a crunch of participants. In that case, he would consider the alternative design, which may be qualitative or case studies. Therefore, the participants' availability determines the research design selection.
- **Time duration:** This is another critical factor, especially for academic research, where students have a limited data collection period to complete their thesis/dissertation work. For example, a crunch of time duration may force the researcher to go for a cross-sectional design. In contrast, plenty of time duration enables one to select a longitudinal research design. Therefore, a researcher needs to relook at the time duration of the research before choosing the research design to avoid disaster in the later stage.

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- **Implications of the research:** The primary purpose of research in nursing is to improvise nursing education and patient care in clinical settings. Therefore, the design primarily focused on education and patient care is more appreciated and accepted than other designs.

VALIDITY OF QUANTITATIVE RESEARCH DESIGNS

Quantitative research is a formal, objective, systematic process using numerical data to obtain information about the world. In quantitative research, the researcher is interested in controlling extraneous variables that may influence study results. These extraneous variables, or competing explanations for the results, are labeled as *threats to internal and external validity* (Campbell and Stanley, 1963). This section presents the details on internal and external validity and associated threats that may bias the findings.

Internal Validity

The internal validity in a quantitative design concerns the degree to which changes in the dependent variable can be attributed to the independent variable. Simply, it is a strength of relationships between dependent and independent variables in an experimental study. In an experiment, high internal validity assures that the result is the direct interaction between dependent and independent variables and not because of influences of other confounding or extraneous factors.

Internal validity refers to the extent to which the study results represent the truth in the selected population under study and not because of any other influences or methodological errors. Internal validity examines the trustworthiness of the methodological aspects of a research study. Lowering the internal validity implies that the result of the study deviates from the truth, and therefore, difficult to infer that independent variables truly influence the dependent variables.

Internal validity enables the conclusion that the independent variables have strong relationships to influence the dependent variables to change. Hence, internal validity answers the question that there is a direct relation between independent and dependent variables or a change in the dependent variables purely because of manipulation of the independent variables.

In experimental design, independent variables are solely responsible for changing the dependent variables or outcomes. Internal validity refers to whether an experimental condition/treatment makes a difference to the outcomes, and there is sufficient evidence to substantiate this claim. For example, suppose a study is planned to see the effect of reminiscence therapy on depression status among patients with depression visiting outpatient departments. This is an example of an interventional study where reminiscence therapy is an independent variable, and depression status is a dependent variable. Here, the researcher can expect a high degree of internal validity if he follows all salient features of true experimental design—*manipulation, randomization,* and *control* to minimize the impact of the extraneous environmental conditions during the experiment.

Threats to Internal Validity

Campbell and Stanley (1963) have identified eight classes of extraneous variables that might produce changes or alter the actual effect of independent variables on dependent variables

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and breach the internal validity of the research. These are also called *threats to internal validity* and are described below:

- **Selection bias:** Selection bias is the most common threat to internal validity, where a researcher may impart the bias while recruiting or enrolling the research participants. Using random assignment of the participants or strict adherence to the inclusion and exclusion (sampling criteria) helps to control the selection bias in the research. For example, suppose a researcher is planning to see the effect of nicotine replacement therapy versus video-assisted intervention on tobacco cessation among tobacco users in an outpatient department. Here, using randomization of the subjects to experimental and control arms will control selection bias and ensure higher internal validity to infer the true impact of nicotine replacement therapy on tobacco cessation.
- **History:** The threat to history occurs when some event besides the study intervention occurs during the course of the study. This event influences the dependent variable and, subsequently, the study's outcomes. For example, a researcher has planned a study to see the efficacy of two weeks of structured teaching and awareness programs on the harmful effects of alcoholism in a rural community setting. Subsequently, a hooch tragedy happened and got a lot of media and extreme political attention on the harmful effects of alcoholism. The harmful effects of alcoholism are broadcasted on all local and national newspapers and television. This outbreak could lead to improvement of the knowledge on harmful effects of alcoholism of the study participants and may dilute the actual effect of the structured teaching and awareness program on harmful effects of alcoholism and referred to as a history *threat to internal validity*.
- **Maturation effect:** Maturation refers to the changes in the status of the participants as a function of time, such as physical, psychological, and biological changes in human participants. For example, a pediatric nurse is interested in studying the effect of a uniquely developed intervention protocol on the weight of sick admitted neonates in the neonatal intensive care unit. Here, nurse researcher should know that weight gain in children is a normal developmental process over age. If this experiment continues for a longer time, it will be difficult to conclude the actual effect of the intervention on outcomes.
- **Testing:** Testing refers to the extent to which repeated administration of the same instrument changes participants' responses. It is also known as *sensitization effects*. In simple words, the pre-test works as a '*treatment*.' For example, suppose subjects scored on knowledge of a procedure and were told their score before the simulation skill training program. In that case, these subjects may improve their score because they may be sensitized that their score is below the acceptable limit.
- **Experimental mortality:** It is also referred to as *attrition* or *dropout effect*. Experimental mortality is the extent of dropout of participants from one data collection point to another point in the study. A high mortality effect appears if a study's attrition rate exceeds 20%. Traditionally, a longitudinal study that needs long-term follow-ups may have a high degree of sample mortality and be prone to *experimental mortality*. Therefore, a researcher should always estimate sample size and add at least 10% extra sample size to the estimated size to prevent the effect of dropout in a study.
- **Instrumentation:** The instrumentation effect is the degree to which calibration in the instruments or observers or scorers may produce a change in the score/response of the study participants. Usually, bio-physiological methods, such as thermometers, sphygmomanometers, and other computerized machines are more likely to face

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instrumentation effects. Therefore, equipment calibration is necessary before and during data collection to prevent such effects. Similarly, using the same instrument throughout the study and consistently training data collectors or team members minimize instrument-related errors.

- **Statistical regression:** It is also called regression to the mean. In research, statistical regression occurs if subjects are selected based on their extreme score, which could be extremely higher or lower. Statistical regression occurs because of the administration of an instrument multiple times. For example, a group of children with very high scores on a self-efficacy scale is selected for treatment in the experiment. However, if the students perform well, they may not be able to perform beyond the highest possible performance on this scale, called the *ceiling effect,* and the opposite is the *floor effect*.
- **Selection-maturation interaction:** The degree to which interaction of selection of the comparison group and maturation of the participants may lead to confounding outcomes and flawed interpretation that the outcomes are the true impact of independent variables over dependent variables.

External Validity

The word *external validity* is interchangeably used with the term 'generalizability' which refers to the applicability of the findings to other people, setting, or times.

External validity, first described by Campbell and Stanley (1963), refers to the degree of the extent to which the results of the study can be generalized across other populations, settings, treatment variables, or measurement variables. Generalizing across populations includes the application of the outcomes to populations, settings, or times that were not represented in the sample. Further, the concept of external validity elaborated on whether the identified causal relationships are maintained over variations in person, settings, time, or treatment variables. Poor external validity implies that the research outcomes may not directly apply to the population who have not participated in the research. Consequently, this leads to low implications for others.

Random selection of the study participants assures a representative sample of the target population and thus improves the findings' external validity or generalizability.

Campbell and Stanley (1963) identified four factors that may jeopardize external validity—(1) Hawthorne effect, (2) Experimenter effect, (3) Reactive measurement effects/testing, and (4) Novelty effect, as given below:

1. **Hawthorne effect:** Research participants may behave in different patterns because they are aware of being observed or the presence of the observer/researcher, referred to as the *Hawthorne effect.* Awareness of being observed may intend to change the participants' natural or usual behavior. For example, a researcher conducted an observational survey on hygiene practices among health professionals and their compliance with them. In this situation, direct observation of health professionals may sensitize them, and they may change their usual behavior to hygiene practices.
2. **Experimenter effect:** Experimenter effect refers to the impact of a researcher's behavior or characteristics on the study participants' behavior. For example, the influence of dressing sense, language, gestures, and posture of the researcher on the behavior of the participants during data collection. Thus, how the researcher speaks, dresses up, or behaves in mannerisms may change the participants' behavior toward the research question. In non-experimental studies term, *Rosenthal effect* is used in place of the *experimenter effect*.

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3. **Reactive measurement effect:** Reactive measurement effect refers to the reactive effect of pretesting in which the effect on participation in one aspect of the treatment affects the outcome findings in other treatment phases, also known as the *sequencing effect.* Taking tests multiple times may sensitize the study participants, which intended the subject to perform higher in the subsequent test. For example, a researcher is planning to conduct a study to assess the effect of breast self-examination on women of the reproductive age group. In this stage, the researcher collects preliminary background information from the participants, which makes subjects sensitized to learn about the breast self-examination and may be liable to change the test scores later.
4. **Novelty effect:** Using a new treatment approach may change the participants' or the researcher's usual behavior or response to research questions. Participants may behave differently to the new intervention approach and do things differently. Once the participants are familiar with the treatment, the result or responses might differ.

TYPES OF RESEARCH DESIGNS IN NURSING

Research designs in nursing are classified into different styles by different researchers and scholars from time to time. There is no uniform classification system to follow, and each researcher or author has a way of classifying the research design. Moreover, there is a discrepancy in the use of terminologies for research designs in different disciplines, making it more challenging for scholars and students to learn a unique way of classification.

This section presents the most simplified and easiest way of classification for research designs practiced by biomedical and social sciences experts.

Broadly, research designs are classified in following three categories and several sub-categories as given below:

1. Quantitative research designs
2. Qualitative research designs
3. Mixed-method research designs

Table 7.1 highlighted the basic classification along with salient features of the popular designs and sub-types used in nursing.

EXPERIMENTAL RESEARCH DESIGNS

Experimental research is objective, systematic, and highly controlled research to establish cause-and-effect relationships. The use of rigorous control measures makes the experimental design one of the most influential and considered the *gold standard* for creating evidence about cause-and-effect relationships and judging other designs. These designs aim to associate treatment with its outcomes by minimizing the effect of other extraneous variations on the outcomes and reducing errors introduced by extraneous or confounding variables. A true experimental design is characterized by its key features—the random assignment of participants to groups, manipulation of the independent variables, or administering some treatment and control of extraneous variations. These characteristics increased confidence in establishing cause-and-effect relationships.

However, most nursing research focuses on patients, where control of extraneous influences is almost impossible. Therefore, in nursing, quasi-experimental or non-experimental designs are more prevalent where a researcher may relax one of the features of a true experiment—*control group* or *random assignment of the subjects*. Experimental research designs are

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TABLE 7.1: OVERVIEW OF DIFFERENT TYPES OF RESEARCH DESIGNS IN NURSING.

Designs	Sub-designs	Salient features
Experimental research designs	**True experimental design or randomized controlled trial** • Pre-test-post-test control group design • Post-test only control group design • Solomon four-group design • Crossover design • Factorial design • Latin square design • Split body design • Parallel group design	These are the most popular designs in nursing and other allied health sciences and are also called randomized controlled trials (RCT). These designs will have key features of an experimental research design; manipulation, control, and randomization A researcher may use more measures, such as masking/blinding or allocation concealment to control extraneous variables to prevent selection and researcher bias
	Quasi-experimental designs • One group pre-test-post-test design • Non-randomized post-test control group design • Non-equivalent control group design • Time series design • Time series non-equivalent control group design • Time series with withdrawal or re-instituted treatment design • Survey research design • Exploratory research design	It is a modified version of the true experimental design, where the researcher manipulates independent variables to see the effect on dependent variables without using a control group or randomization process in allocating the participants in the study arms, also called controlled trials without randomization or non-randomized controlled trials *Survey research:* This research primarily focuses on superficial information about the phenomenon under study. Traditionally, survey research use questionnaires, checklist, or rating scale to collect information from a large population *Exploratory research design:* Exploratory research design deals with exploring a phenomenon in detail. This design is preferred to develop a vast understanding of a little-explored area/topic
Observational/non-experimental designs	• Descriptive research design: ◆ Univariate descriptive research design ◆ Prevalence/incidence studies ◆ Cross-sectional/longitudinal studies • Correlational research design • Cohort research design: ◆ Prospective cohort design ◆ Retrospective cohort studies • Case-control research design • Analytical cross-sectional design	*Descriptive research design* aims to systematically obtain information to describe a phenomenon, situation, or population. Simply put, it only answers how, what, where, and when about the phenomenon under study rather than the why *Correlational research designs* examine the relationships between two or more variables in a natural setting The cohort research design examines the cohort prospectively (cause-effect) or retrospectively (effect-cause) Case-control research design retrospectively observe the case and control cohort from effect to cause. Analytical cross-sectional design is a type of quantitative, non-experimental research design. These studies seek to 'gather data from a group of subjects at only one point in time'. The study aims to find association between an exposure and a disease, condition or outcome within a defined population
	Clinical trials	Clinical trials aim to study new tests and treatments and evaluate their effects on human health outcomes. Trials involving human participants need to be carefully designed, reviewed, and completed and need prior approval before they actually begin. Biomedical clinical trials have 4 phases; phase 1-phase-IV

Contd...

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- It helps clarify and cross-check the unexpected, unusual findings obtained in one method by applying another method.
- Qualitative aspect of mixed-method research provides valuable findings to develop hypotheses that can be tested through quantitative research.
- Qualitative aspects of the mixed method enable the researcher to understand the process or development of a phenomenon, while the quantitative part focuses on the outcome or end result of the research.

Limitations

- Both qualitative and quantitative research follow separate and unique paradigms, and integrating findings from two different research methods is challenging for the researchers.
- Integrating two distinct methods (process, data collection, analysis, interpretation, and presentation) is time-consuming and requires different skills and experiences. In addition, mixed-method research requires a team of experts who know different aspects of mixed-method research, such as planning, integrating, analyzing, and presenting the data.
- There is data integration in mixed-method research, which is practically difficult. To integrate data, researchers require innovative thinking to integrate two different data types to represent them more meaningfully.
- Diversity in the presentation of data is another challenge for the researcher. It has been seen that some of the researchers present and publish quantitative and qualitative data separately for different audiences.
- Researchers often face problems in getting ethical permission due to the lack of a fixed and linear plan in the advance absence of exact details of the research question and objectives of the qualitative approach before the completion of a quantitative phase.
- Mixed method designs in nursing and the social and behavioral sciences are relatively evolving concepts. Many of the terms are still confusing to budding researchers, and the literature is challenging to locate, which may not give a clear pathway to conduct the studies.
- The primary reason for using mixed method research designs is to maximize the use of integrated/blending methods to answer a complex research question within a study (i.e., converge and confirm findings from the application of two different methodological techniques).

SUMMARY

- *Research design* can be defined as a master plan that outlines the research process and consists research approach, setting, population, sample, sampling technique, research instrument, and plan for analysis to test hypotheses or answer a research question.
- The selection of research design is influenced by the nature of the phenomenon under study, the research question, available resources, such as time, money, workforce, ethical issues, availability of the participants, and the researcher's experiences.
- *Research designs* are principally classified into three categories: (1) quantitative research design, (2) qualitative research design, and (3) mixed-method research design.
- *Non-experimental design* is further classified into exploratory research design, descriptive design, correlational design, comparative design, case-control design, etc.

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- *Quantitative research designs* involve experimental, quasi-experimental, and non-experimental designs.
- *Qualitative research design* involves phenomenological research, ethnography design, grounded theory design, case studies, action research, and historical research design.
- *Mixed method research* uses a blending approach to answer a complex research question. Researchers use a combination of quantitative and qualitative research approaches blended within a single study for data collection, analysis, and interpretation to answer the research question.

REVIEW QUESTIONS

Long and Short Answer Questions

1. Briefly discuss different research designs popular in nursing and mention the salient features of quantitative research design.
2. Briefly discuss true experimental design and explain the key features of experimental design.
3. Explain the characteristics of a good research design.
4. Briefly explain the components of research design.
5. Discuss the factors affecting the selection of a research design.
6. Briefly discuss the rigor and validity of the quantitative research design.
7. Explain qualitative research design and briefly discuss popular qualitative research designs.
8. Explain quasi-experimental research design and its different variants.
9. Discuss the strengths and limitations of experimental research designs.
10. Briefly discuss the different types of survey research studies.
11. Briefly discuss longitudinal and cross-sectional survey designs.
12. Explain phenomenology and its key characteristics.
13. Historical research and advantages.
14. Action research.
15. Methodological studies and uses in biomedical sciences.
16. Briefly discuss the classification of mixed-method research and its advantages in nursing.

MULTIPLE CHOICE QUESTIONS

1. It is a blueprint of a study that facilitates where, how, and what data to be collected from the participants is?

a. Research approach
b. Research design
c. Conceptual framework
d. Hypothesis

2. It is a type of research design that allows the researcher to test the effect of an independent variable on dependent variables is:

a. Experimental design
b. Exploratory design
c. Descriptive design
d. Comparative design

3. Which of the following are salient feature(s) of a classical experimental research design?

a. Manipulation
b. Control
c. Randomization
d. All of the above

4. It is a threat to internal validity which occurs due to changes in the status of the participants as a function of time such physical, psychological, or biological changes in human participants is:

a. Maturation effects
b. Statistical regression effects
c. Experimenter effects
d. Instrumentation effects

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