

RESEARCH METHODOLOGY

[PT 309]

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LECTURE NOTES FOR 3rd GRADE BPT STUDENTS

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INTRODUCTION TO RESEARCH METHODOLOGY

LECTURE OUTLINE

- Learning objectives
- What is research
- Research processes
- Objective of research
- Types of research
- Review
- Reading resources/additional materials

RESEARCH METHODOLOGY

COURSE OBJECTIVES

- Define research concepts, populations, samples, and sampling techniques.
- Know different methods of data collection and data distributions
- Be able to formulate and test hypotheses using statistical measures.
- Compare research designs and demonstrate skills in writing proposals, presentations, and referencing.

RESEARCH METHODOLOGY

What is research?

Research is a continuous voyage of discovery

- Research is a **systematic** & **organized** way of **finding answers** to **questions**.
- **SYSTEMATIC** due to definite set of procedures & steps to follow to get the most accurate results
- **ORGANIZED** there is a structure or method in going about research. It is a planned procedure, not a spontaneous one. It is focused and limited to a specific scope.
- **FINDING ANSWERS** is the end of all research. Whether it is the answer to a specific hypothesis or a simple question, research is successful when we find answers. Sometimes the answer is no, but still it is an answer.
- **QUESTIONS** are central to research. If there is no question, then the answer is no. Research is focused on relevant, useful, & important questions. Without question, research has no focus, drive, or purpose.

- Research involves finding out about things **no-one else knew either**.
- It is about advancing the frontiers of knowledge (unexplored, or least understood areas of a particular field of study)
- A way to gather evidence for your practice
- A systematic investigations to find answers to a problem
- Research is a process for collecting, analyzing & interpreting information to answer certain questions.
- It must as far as possible, be **controlled, rigorous, systematic, valid and verifiable, empirical, and critical**.



RESEARCH METHODOLOGY

Voyage or journey of research

1. Defining & redefining the problem
2. Formulating hypotheses
3. Collecting, organizing, & evaluating data
4. Making deductions (inferences)
5. Reaching conclusions
6. Carefully testing conclusions to determine whether they support the formulated hypotheses



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Objectives of research

1. To gain familiarity with a phenomenon & achieve new insights into it.
2. To accurately describe the characteristics of a particular individual, situation, or group.
3. To determine the frequency with which something occurs or is associated with something else.
4. To test a hypothesis of a causal relationship between variables.



RESEARCH METHODOLOGY

Types of research

1. Descriptive vs Analytical
2. Applied vs Fundamental
3. Quantitative vs Qualitative
4. Conceptual vs Empirical



RESEARCH METHODOLOGY

Types of research

Descriptive vs Analytical

- **Descriptive research** focuses on describing characteristics or behaviors of a particular group, situation, or phenomenon without manipulating variables. It answers "what" questions (e.g., surveys, observational studies).

Example: A survey of the physical activity levels of adults in Kirkuk

- **Analytical research** involves examining information already available (data), to identify patterns, causes, or correlations (e.g., case studies, secondary data analysis).

Example: Examining the relationship between diet and heart disease risk in adults.

RESEARCH METHODOLOGY

Types of research

Applied vs Fundamental

- **Applied research** focused on solving practical, real-world problems. It directly addresses specific issues or challenges (e.g., intervention studies, program evaluation)

Example: Evaluating the effectiveness of a specific exercise program in reducing the risk of falls and improving balance in older adults

- **Fundamental research** aims to expand knowledge by exploring basic principles and theories, without immediate practical application. It focuses on understanding "why" or "how" phenomena occur, contributing to scientific knowledge.

Example: Studying the neural mechanisms of motor control in the brain.

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Types of research

Quantitative vs Qualitative

- **Quantitative research** uses numerical data & statistical methods to test hypotheses or examine relationships between variables (e.g., surveys, experiments).

Example: Evaluating the prevalence of chronic musculoskeletal pain among construction workers in Kurdistan region, Iraq region

- **Qualitative research** involves non-numerical data to explore perceptions, experiences, or social phenomena (e.g. interviews on opinions/experiences)

Example: Exploring the experience of knee osteoarthritic patients with physiotherapy treatment in Erbil, Iraq

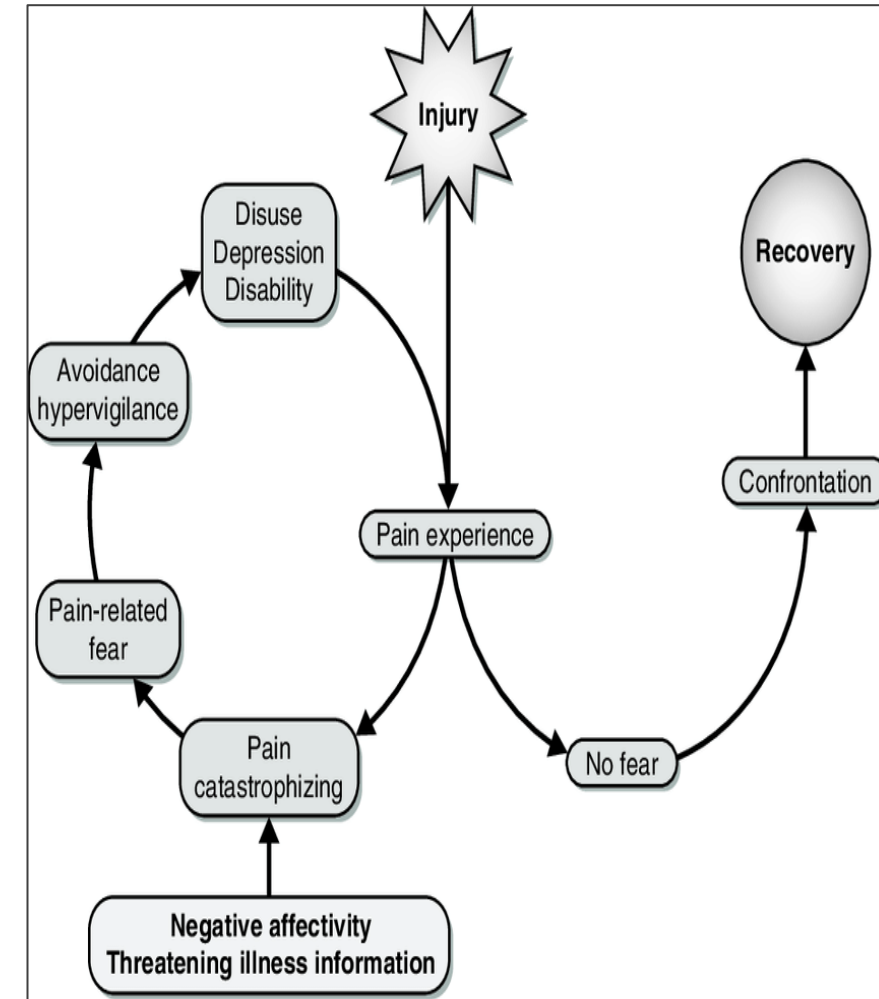
RESEARCH METHODOLOGY

Types of research

Conceptual vs Empirical

- **Conceptual research** involves exploring ideas, theories, or concepts to develop a deeper understanding or to build new frameworks. It doesn't involve data collection or experiments, but focuses on theoretical analysis.

Example: The fear-avoidance model for chronic musculoskeletal pain by Vlaeyen and Linton 2000.



Vlaeyen JWS, Linton SJ. Fear-avoidance and its consequences in chronic musculoskeletal pain: a state of the art. *Pain*. 2000;85(3):317-332.

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Types of research

Conceptual vs Empirical

- **Empirical research** involves collecting and analyzing data through observation, experimentation, or experience. It is based on real-world evidence rather than theory or speculation, & it aims to answer specific research questions by using measurable data.
- Example: Evaluating the effectiveness of a specific exercise program in reducing pain and improving mobility in patients with knee osteoarthritis.

R_{EVIEW}

OTHER READING SOURCES

TEXT

1. Kumar, R. (2011). *Research methodology: A step-by-step guide for beginners (3rd ed.)*. Sage Publications.
2. Kothari, C. R. (2019). *Research methodology: Methods and techniques (4th ed.)*. New Age International.
3. Walliman, N. (2011). *Research methods: The basics (1st ed.)*. Routledge.

THANKS
FOR
LISTENING



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