An Introduction to Research

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2019-07-31

Introduction

Research

Careful and detailed study into a specific problem, concern, or issue using the scientific method

Research process

- Identify the problem
- Define the problem (~~too broad~~ or ~~too narrow~~)
- A plan to answer the question
- Collect data
- Draw conclusion (potentially **RE**search)

Quantitative and qualitative research

- Quantitative: data-driven (statistical models, machine learning, deep learning, . . .)
- Qualitative: social sciences (focus groups, interviews, . . .)

More on research types

Quantitative research:

- Count things
- Large samples
- Know what you want
- Use statistics
- Generalize
- Be distant and **objective**

Qualitative research:

- Contextualize
- Small samples, in-depth
- Discover what you want
- Use words
- Find “meaning”
- Be involved and **subjective**

Research question

What is a research question

An answerable inquiry into a specific concern or issue.

- **Specify** your question
- Determine your goal (what do you want to know)
- Is your question answerable within your lifetime?
- Not too broad or too narrow

Are they good research questions?

- What activities of nurse managers are associated with nurse turnover?
- What predicts registered nurse retention in the US Army?
- Do the elderly diagnosed with dementia experience pain?
- Is yoga as effective as traditional physical therapy in reducing lymphedema in patients who have had head and neck cancer treatment?

Hypothesis and variables

Variables

- Dependent variable (DV): it replies upon IV to occur,
- Independent variable (IV): it can vary and influence the DV

Hypothesis

> *A hypothesis is a tentative statement that **proposes a possible explanation** to some phenomenon or event.*

Every study has a purpose, but not every study has a hypothesis.

A solid hypothesis:

- Makes predictions between variables (cause and effect),
- Should address a part of the research question,
- Well-grounded in existing literature.

Typical hypotheses

1. A prediction,
2. Describe the relationship between an IV and a DV.

Research design

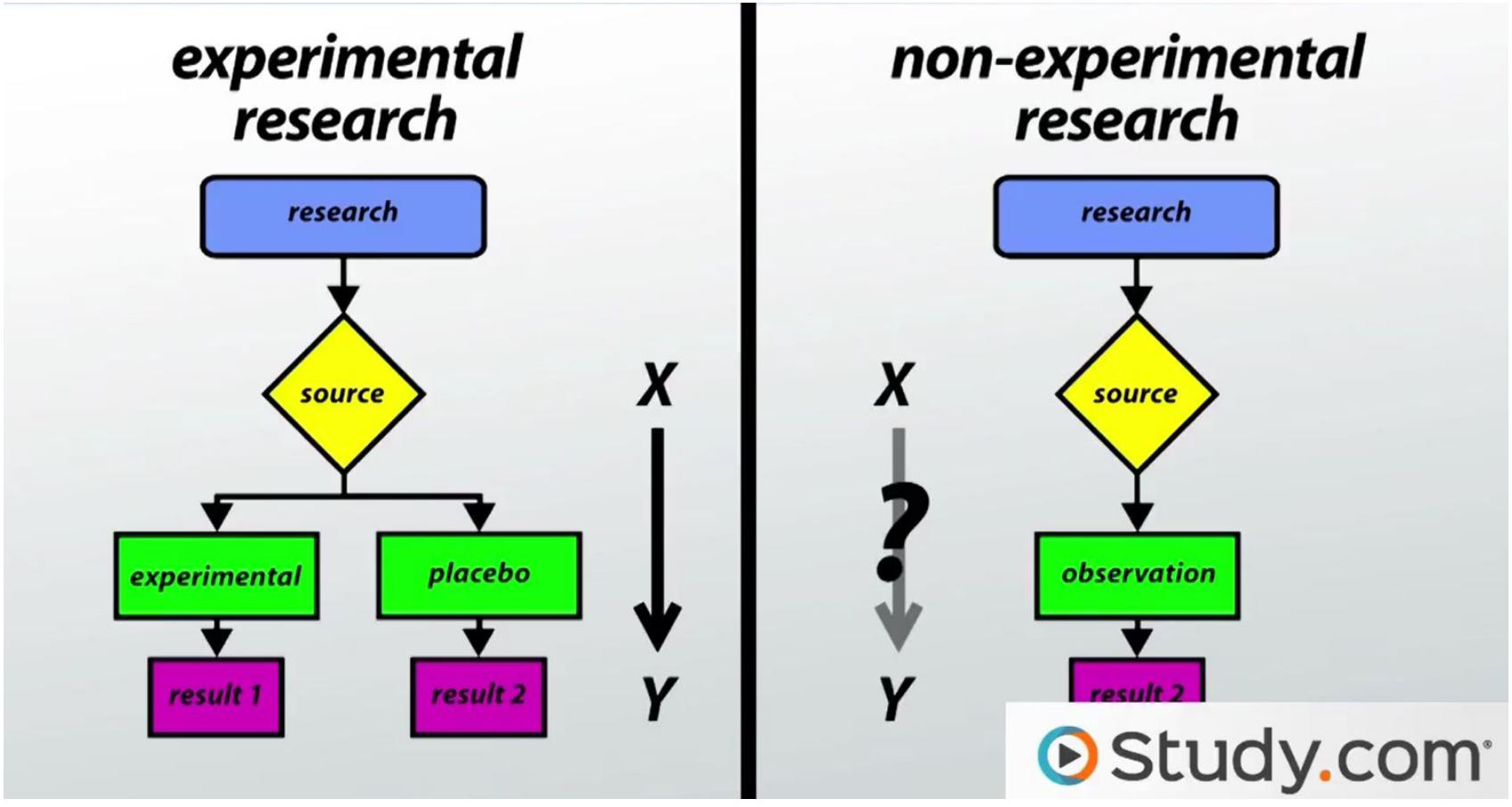

Figure 1: Experimental and non-experimental research

Definitions of experimental and non-experimental design

- Experimental research: **manipulate** the predictor variable (IV) and subjects to identify a cause-and-effect relationship,
- Non-experimental research: it lacks the manipulation of an independent variable, random assignment of participants to conditions or orders of conditions, or both.

Sample abstracts

Questions to look for

- What is the research question?
- What is the research aim?
- Quantitative or qualitative research?
- Experimental or non-experimental design?
- If it is non-experimental design, what type of non-experimental?

Abstract 1

American Journal of Medical Quality
1–8

DOI: 10.1177/1062860617708608
ajmq.sagepub.com
SAGE

Does Level of Hospital Matter? A Study of Mortality of Acute Myocardial Infarction Patients in Shanxi, China

Miao Cai[1,2], Echu Liu, PhD[2], Hongbing Tao, PhD[1], Zhengmin Qian, PhD, MD[2], Xiaojun Lin[1], and Zhaohui Cheng, PhD[1]

Abstract

This study compares risk-standardized mortality rates (RSMRs) of patients with acute myocardial infarction among tertiary A (typically, advanced urban hospitals with more than 800 beds), tertiary B (urban hospitals with more than 500 beds), and secondary A hospitals (rural and urban hospitals with less than 500 beds) in Shanxi, China. In all, 43 500 acute myocardial infarction inpatient records from 93 hospitals were included. Hierarchical logistic regression was used to estimate RSMRs, and Dunn's post hoc test was used to make pairwise comparisons of RSMR between hospital levels. It was found that the median RSMRs of secondary A hospitals were significantly lower than those of tertiary A and tertiary B hospitals (at 1% and 10% significance level, respectively), while there was no significant difference between the median RSMRs in tertiary A and tertiary B hospitals. The reasons for significant disparity in quality of care among different hospital levels requires further exploration.

Figure 2: Level of hospital

Abstract 2

Does A Medical Consortium Influence Health Outcomes of Hospitalized Cancer Patients? An Integrated Care Model in Shanxi, China

Miao Cai*, Echu Liu†, Hongbing Tao‡, Zhengmin Qian*, Qiang (John) Fu*, Xiaojun Lin‡, Manli Wang‡, Chang Xu‡ and Ziling Ni‡

Objective: To assess the effect of the medical consortium policy on the outcomes of cancer patients admitted to secondary hospitals in Shanxi, China.
Method: Electronic medical records of lung cancer (n = 8,193), stomach cancer (n = 5,693) and esophagus cancer (n = 2,802) patients hospitalized in secondary hospitals were used. Propensity score matching was used to match each patient enrolled in medical consortium hospitals with a counterpart admitted in non-medical consortium hospitals. Cox proportional hazard models were used to estimate the hazard ratio of patients enrolled different categories of hospitals.
Results: The hazards of lung, stomach and esophageal cancer patients admitted in medical consortium hospitals were consistently and significantly lower than those admitted in non-medical consortium hospitals after adjusting for a number of potential confounders. Lower hazard ratios were associated with lung (hazard ratio (HR) = 0.533, $p < 0.001$), stomach (HR = 0.494, $p < 0.001$), and esophagus (HR = 0.505, $p < 0.001$) cancer patients in medical consortium hospitals.
Conclusion: The medical consortium provides an effective strategy to improve the outcomes of cancer patients in Shanxi, China. The partnerships between top-tier hospitals and grassroots medical services bridge the gap in resources and plays a critical role in the quality of care in China.

Figure 3: Medical consortium

Abstract 3

Roxadustat Treatment for Anemia in Patients Undergoing Long-Term Dialysis

N. Chen, C. Hao, B.-C. Liu, H. Lin, Caili Wang, C. Xing, X. Liang, G. Jiang, Zhengrong Liu, X. Li, L. Zuo, L. Luo, J. Wang, M. Zhao, Zhihong Liu, G.-Y. Cai, L. Hao, R. Leong, Chunrong Wang, C. Liu, T. Neff, L. Szczech, and K.-H.P. Yu

ABSTRACT

BACKGROUND

Roxadustat is an oral hypoxia-inducible factor prolyl hydroxylase inhibitor that stimulates erythropoiesis and regulates iron metabolism. Additional data are needed regarding the effectiveness and safety of roxadustat as compared with standard therapy (epoetin alfa) for the treatment of anemia in patients undergoing dialysis.

METHODS

In a trial conducted in China, we randomly assigned (in a 2:1 ratio) patients who had been undergoing dialysis and erythropoiesis-stimulating agent therapy with epoetin alfa for at least 6 weeks to receive roxadustat or epoetin alfa three times per week for 26 weeks. Parenteral iron was withheld except as rescue therapy. The primary end point was the mean change in hemoglobin level from baseline to the average level during weeks 23 through 27. Noninferiority of roxadustat would be established if the lower boundary of the two-sided 95% confidence interval for the difference between the values in the roxadustat group and epoetin alfa group was greater than or equal to –1.0 g per deciliter. Patients in each group had doses adjusted to reach a hemoglobin level of 10.0 to 12.0 g per deciliter. Safety was assessed by analysis of adverse events and clinical laboratory values.

RESULTS

A total of 305 patients underwent randomization (204 in the roxadustat group and 101 in the epoetin alfa group), and 256 patients (162 and 94, respectively) completed the 26-week

The authors' full names, academic degrees, and affiliations are listed in the Appendix. Address reprint requests to Dr. Chen at the Department of Nephrology, Ruijin Hospital, Shanghai Jiao Tong University School of Medicine, 197 Ruijin 2nd Rd., Shanghai 200025, China, or at nanchenmd@hotmail.com.

This article was published on July 24, 2019, at NEJM.org.

DOI: 10.1056/NEJMoa1901713

Abstract 4

Narratives of Recovery from Serious Psychiatric Disabilities: A Critical Discourse Analysis

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Abstract

We analyzed separate interviews of two adults about their experiences with psychiatric disability, the mental health treatment system and recovery using critical discourse analysis (CDA). Our goal was to contribute a more detailed portrait of the process of recovery from serious psychiatric disability by exploring the commonalities and departures within the interviews. To foreshadow the conclusions, each participant's representation of self shifted across two domains. Furthermore, these representations shifted reflexively with changes occurring in their environments and social support systems. This research sheds light on the nature of disease-centered subjectivities and the construction of practice and policy contexts that build on the domains where the adults demonstrate the greatest agency and ability. Practical implications for mental health research, policy and practice are shared.

Final presentation

Contents

1. What is the issue?
2. What is the current research related to this issue?
3. Choose one article and:
    i. What was their research question(s)?
    ii. Was the study an experimental or non-experimental design?
    iii. What were the independent and dependent variables (if applicable)?
4. What are prevention strategies related to the issue?
5. Is this a public health issue in China? Are there differences in different countries related to this issue?
6. What are future steps related to research and practice?

Presentation notes

- The presentations should be no more than 15 minutes.
- Each student should have a speaking role in the presentation.
- Think about what is the most relevant or interesting information for your classmates.