Answering Questions in Practice: Bridging the Gap between Research & Practice

Dr. Michelle Young-Brown
Pharmaceutical Society of Jamaica
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“Research can be undertaken in any kind of environment, as long as you have the interest. I believe that true education means fostering the ability to be interested in something.”

Sumio Lijimo
Challenges with Research

• It seems hard
• Belief; This is not for me
• I don’t have the time
• Fear of the unknown
Introduction

• “Research is formalized curiosity. It is poking and prying with a purpose.” -Zora Neale Hurston

• Questions, Controversies and Opportunities exist in every field of practice.

• Pharmacy Practice Research focuses on targeting the knowledge & skills of Pharmacists in:
  ▫ Solving Problems
  ▫ Meeting the healthcare needs of the population
Objectives

- To identify three major approaches to research and describe the use of these methods

- To compare and contrast the different methods or approaches to research and the benefits of one against another.

- To identify questions in the practice setting, formulate relevant topics and discuss how to incorporate research in the day job; bridging the gap between research and practice

- To discuss the use of different methods applying them to questions in various practice settings
Research is .............

- Human activity based on intellectual investigation and is aimed at discovering, interpreting, and revising human knowledge on different aspects of the world. Research can use the scientific method, but need not do so.

Attempt to find out information in a systematically and scientifically manner
Research Approaches

- Qualitative
- Quantitative
- Other
  - Pragmatic/Mixed Methods
  - Emancipatory
Research Approaches

Qualitative Research
• Research that deals with phenomena that are difficult or impossible to quantify mathematically such as beliefs, attitudes, attributes etc.

• *Asks questions; why and how*
Qualitative Research

• **Advantages**
  - It enables more complex aspects of a person's experience to be studied.
  - Fewer restrictions or assumptions are placed on the data to be collected.
  - Not everything can be quantified, or quantified easily, individuals can be studied in more depth.
  - Good for exploratory research and hypothesis generation.
  - The participants are able to provide data in their own words and in their own way.

• **Disadvantages**
  - It is more difficult to determine the validity and reliability of linguistic data.
  - There is more subjectivity involved in analysing the data.
  - "Data overload" - open-ended questions can sometimes create lots of data, which can take a long time to analyse.
  - Time consuming.
Quantitative Research

• refers to the systematic empirical investigation of any phenomena via statistical, mathematical or computational techniques. The objective of quantitative research is to develop and employ mathematical models, theories and/or hypotheses pertaining to phenomena

• *Asks questions; how many*
Quantitative Research cont’d

• Usually involves collecting and converting data into numerical form so that statistical calculations can be made.
• Objectivity
• External factors
• Moves from general to specific and is often referred to as the top down approach
Quantitative Research

• **Advantages**
  • Quantitative research allows the researcher to measure and analyse data.
  • The researcher is more objective about the findings of the research.
  • Quantitative research can be used to test hypotheses in experiments because of its ability to measure data using statistics.

• **Disadvantages**
  • The main disadvantage of quantitative research is the context of the study or experiment is ignored.
  • Quantitative research does not study things in a natural setting or discuss the meaning things have for different people.
  • A large sample of the population must be studied for more accurate results.
# Commonly-Cited Distinctions Between Qualitative and Quantitative Research*

<table>
<thead>
<tr>
<th>Qualitative</th>
<th>Interrelated</th>
<th>Quantitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides depth of understanding</td>
<td>Measures levels of occurrence</td>
<td></td>
</tr>
<tr>
<td>Studies motivation</td>
<td>Studies actions</td>
<td></td>
</tr>
<tr>
<td>Is subjective</td>
<td>Is (relatively) objective</td>
<td></td>
</tr>
<tr>
<td>Enables discovery</td>
<td>Provides evidence</td>
<td></td>
</tr>
<tr>
<td>Is exploratory</td>
<td>Is definitive</td>
<td></td>
</tr>
<tr>
<td>Allows insights into behavior, trends, interprets</td>
<td>Measures level of actions, trends, and so on</td>
<td></td>
</tr>
<tr>
<td>Studies process</td>
<td>Describes, predicts</td>
<td></td>
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<tr>
<td></td>
<td>Measures point(s) in time</td>
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*These distinctions do not always hold, but reflect typical ways in which the two methodologies are used.*
# Which to Use: Qualitative or Quantitative Methods

<table>
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<th>Issues to Consider</th>
<th>Use qualitative methods when you...</th>
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<td>Purpose of research</td>
<td>seek a richer, more personal picture of individual motives, decisions, or practices.</td>
<td>need to calculate numerical indicators/ parameter estimates of populations.</td>
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**NOTE:** Because sample sizes are smaller and respondent selection is purposive, the results of qualitative research do not lend themselves to statistical generalization.
## Which to Use: Qualitative or Quantitative Methods

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<td><strong>Purpose of research</strong></td>
<td>to learn the words, phrases, and concepts used; to develop an awareness of the categories that define an area of investigation.</td>
<td>have identified the salient categories, know which words or phrases are used, and want to know the distribution of these ways of thinking or health practices among your intended audience.</td>
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<td>Sample size</td>
<td>can answer your questions with a relatively small number of participants; want to know more about a small, “elite” group of people.</td>
<td>have the ability to sample systematically so that the sample is statistically representative of that population.</td>
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# Which to Use: Qualitative or Quantitative Methods

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<td>Analytic capabilities</td>
<td>are competent to analyze the findings. Qualitative research has a high degree of flexibility--therefore, it is possible for the researcher to be undisciplined and not fully think through the research issue.</td>
<td>have good statistical &amp; analytic skills.</td>
</tr>
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Pragmatic or Mixed Methods

- Utilizes the method best suited to the research question.
- Researchers freely utilize any method, technique or procedure. May be used simultaneously or sequentially.
Emancipatory

• Also called Advocacy or participatory approach.
• Focuses on vulnerable groups
• Not afraid to take sides.
• Sometimes criticized as not being objective
In descriptive studies, we:

- Can specify one or more variables.
- We don’t know enough to specify the direction of the relationship among the variables.
- We may simply wish to describe who participates in a study and how they act, believe, perceive the world, or look.
- We use a research question rather than a hypothesis.
Examples of research questions for descriptive studies

- The Management of Hospital Acquired Pneumonia in a Tertiary Care Facility.
  - Were sputum cultures done?
  - What are the patient risk factors?
  - What organisms were isolated and what is the sensitivity/resistance?
  - Was the choice(s) of antibiotic appropriate?
  - Was the patient adequately and appropriately monitored?
  - What were the patient outcomes?
The art and science of asking questions is the source of all knowledge. *Thomas Berger*
Questions that arise in practice

• Patient access to the pharmacist and pharmaceutical care

• How can Pharmacy services change /evolve to meet the needs of a changing population?
Questions that arise in practice

• What are the reasons for patient non-compliance?
  ▫ Patients’ attitude towards a new treatment modality or drug presentation and its impact.
  ▫ Incidence of Adverse events

• How effective are nutraceuticals?
• Impact of Pharmacists on Patient Adherence
Research Topics

- Research topics can come from your experiences

- What questions have you asked from your practice?

- Inquisitive minds ask questions, questions can become research topics

- Anyone can participate in research
Scenario One

- A number of patients filling prescriptions at your pharmacy for chronic medications are not filling scripts on time. You notice that some patients are not filling all items on the prescription either.

- What could be a possible research topic?

- What research approach would be ideal?
Strategy: Scenario One

What is the problem?
• Non-compliance

What questions would you need answered?
• What is the incidence of non-compliance?
• What are the contributing factors?
• What measures can be implemented and how effective are those measures?

Targeted Research Topic
• The Incidence and Impact of Pharmacist Intervention on Patient Compliance

What method can be utilized?
• Patient selection, Informed Consent, Patient Interviews, Patient Education, Creative Strategies, Measuring outcomes
Scenario Two

• A patient presents to your pharmacy complaining of a dry cough for the past month. He is Hypertensive and maintained on Indapamide SR and Lisinopril for the past 3 months.

• What could be a possible research topic?

• What research approach would be ideal?
Strategy Scenario Two

What problem has been identified?
• Possible Adverse Drug Reaction

What are the questions that arise?
• Is there a disease condition that may be responsible?
• Are there any other signs or symptoms associated with the dry cough?
• What medications if any may be responsible?

What would be an appropriate research method?
• Patient Interview with a detailed medical and medication history, Pharmacist Drug Review, Assessing patient outcomes

Actions
• Reporting; Physician, Ministry of Health (PharmWatch)
Studies that answer critical questions
Are All Generics Really created equal?

**Evaluated Generic Products**
- 20 Gentamicin generic products approved for intravenous use, purchased in Colombia or imported from Germany, Austria, and the US

**Study Design**
- In vitro study: MIC, MBC
- In vivo study: neutropenic mouse thigh infection model

**Main Findings**
- In vitro study: 1 generic product significantly inferior (MIC and MBC, respectively, 45.3 and 64 vs 0.71 and 0.79 mg/L, $P < .05$)
- In vivo study: 10 generic products displayed significantly lower efficacy against *Escherichia coli*
Generics

Evaluated Generic Products

• 65 Clarithromycin generic products manufactured in 18 countries

Study Design

• Generic products were examined visually, assayed by HPLC for Clarithromycin content and impurities, and tested for dissolution properties
Generics cont’d

Main Findings

• 9% of generic products did not contain between 95% and 105% of the amount of Clarithromycin claimed in the label (Latin America, 17%; Asia-Africa-Pacific, 8%, and Europe, 10%)

• 1 generic product failed to meet the dissolution specification (80% of the drug must dissolve in 30 min)

• 19% (12/65) of generic products exceeded Abbott Laboratories’ 3% limit for total impurities
Dabigatron Adherence

Study Design

- 4863 patients across 67 centres with nonvalvular Atrial Fibrillation receiving at least 30 days of Dabigatron.
- Patients followed from 2010 to 2012
- Pharmacist Actions: Patient selection, education & monitoring

Results

- 27.8% non-adherence.
- Greatest level of adherence seen with patient monitoring not education.

*JAMA. 2015;313(14):1443-1450*
Medication Errors

• Study: Prescribing Errors and Other problems reported by Community Pharmacists by Chen et. Al 2005

• Over a one month period 9 Pharmacists documented prescribing errors, interventions and causes.

• The reporting rate was 0.2 to 1.9% inversely proportional to dispensing volume
Medication Errors cont’d

Results

- For 32,403 items dispensed the error rate was 0.6%
- Incomplete/inaccurate orders 131/196 or 67%
- Hazardous Combinations - 17 cases or 9%
- Inappropriate directions for use - 15 cases or 8%

Interventions

- Medications dispensed (29%) Receptionist contacted (17%), Doctor Contacted (26%), Information obtained from patient or pharmacy database (21%), Patient referred back to Physician (5%)
Tips to Incorporate Research into Everyday Life

- Select projects that really make a major difference to the patients and healthcare providers who will participate in them.

- Set bold, clear, measurable aims and a timeline for achieving them.

- Assemble a multidisciplinary team (including providers, stakeholders and methodology experts) tailored to the aim of the project.
Tips to Incorporate Research into Everyday Life

• Be creative in recruiting experts

• Develop the most rigorous study design possible without disrupting normal work unduly
  ▫ Pharmacists can target data collection as a part of their Drug Utilization Reviews in researching Antimicrobial resistance
Tips to Incorporate Research into Everyday Life

- Do everything possible not to sacrifice data quality and completeness

- Take advantage of available certification or training opportunities

- Do not assume that major external funding is necessary to perform credible improvement work
Tips to Incorporate Research into Everyday Life

• Pay careful attention to ethics and acquire all necessary approvals.

• Where possible anticipate and seek publication
  ▫ Peer reviewed journal
  ▫ Professional Association website
  ▫ Newspaper article
  ▫ Seminars etc.
Pharmacy evidence gap
Summary

• There are different approaches to conducting research
• There is flexibility to choose one or a combined approached
• Research should be a part of your day to day functions
• At the most basic level collecting data and reporting to the relevant authorities is key.
• We must overcome all fears and doubts and above all WRITE IT DOWN
References


• Underwood, Carol (2007) Qualitative Methodologies Johns Hopkins University Bloomberg School of Public Health


• Golmann, Don .(2010) . Ten tips for incorporating scientific quality improvement into everyday work BMJ Qual Saf 2011;20:i69-i72 d
That's all Folks!