Mixed Methods Approaches: Design Models

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Objectives

- Mixed Methods in Health Research
- Designing Mixed Method Studies
- Integrating Qualitative and Quantitative Data
- Examples in Practice: 3 Mixed Method Studies
- Special Considerations in the Delivery System
Mixed Methods: an Overview

- Mixed method research is comprised of studies that include both quantitative and qualitative approaches in design and analysis.
- Quantitative methods incorporate statistically generalizable analytical approaches. They provide greater breadth.
- Qualitative methods involve focused, exploratory approaches which yield experience-based detail and context. They provide greater depth.
Which would you prefer?
Which would you prefer?
Which would you prefer?
Complex problems require complex solutions
  ◦ Health care paradigm shift: treating the *patient* instead of the *condition*
  ◦ Social and behavioral factors affecting physiological health outcomes
  ◦ Disparities in health care and health outcomes

Multidisciplinary approaches offer complementary, not competitive, insight
Mixed Methods: When and Why?

- Ideal/Experimental versus Actual/Pragmatic
- Particular value for certain types of studies
  - Disparities research
  - Program evaluation
  - Process and systems studies
  - Quality assurance and improvement
  - Implementation science
  - Patient-centered and community-based research
- Increased interest from funding agencies
  - NIH, AHRQ, CMS, PCORI
Challenges and Considerations

- Matching aims and answers
  - Choose methods that are the most appropriate for the research question
  - Mixed methods are not always the best fit

- Study timeframes and available resources

- Analytical complexity

- Publication of results
Initial design considerations: the 5 W’s

- **Who**
  - Population of interest & sampling frame(s)
- **What**
  - Research questions and outcomes of interest
- **When**
  - Study timeframe and duration
- **Where**
  - Study setting and data sources
- **Why/How**
  - Methods selection
Designing a Mixed Methods Study

Creating the mixed methods research team
- Multidisciplinary, interdisciplinary, and transdisciplinary approaches
- Breadth and depth of expertise
- Collaboration is a critical factor
- Team members’ perception of mixed methods research in general is also a critical factor
Designing a Mixed Methods Study

- Concurrent Designs
- Consecutive/Sequential Designs
- Nested Designs
- Phase-based Designs
Common qualitative methods to inform quantitative approaches:
- Observation (clinical process and workflow)
- Interviews (patients and/or providers)
- Focus groups (patients and/or providers)
- Content analysis (open-ended survey responses, provider notes/medical records)
Common quantitative methods to inform qualitative approaches:
- Use of clinical data to identify subgroups of interest for qualitative study
  - Health outcomes data
  - Risk stratification
  - Demographic and geocoded information
- Results of quantitative analyses may identify areas for qualitative exploration
Examples in Practice

- **Study #1**: The Impact of Tailored Diabetes Registry Report Cards on Measures of Disease Control
- **Study #2**: Care by Cell Phone: Text Messaging for Chronic Disease Management
- **Study #3**: Improving Surgical Site Infection (SSI) Risk Stratification and Outcome Detection
Mixed Methods Design: Concurrent

Fischer et al. BMC Medical Informatics and Decision Making 2011, 11:12
http://www.biomedcentral.com/1472-6947/11/12

RESEARCH ARTICLE

The impact of tailored diabetes registry report cards on measures of disease control: a nested randomized trial

Henry H Fischer1,2, Sheri L Eisert1,3, M Josh Durfee4, Susan L Moore4, Andrew W Steele1,2, Kevin McCullen5, Katherine Anderson1,2, Lara Penny2, Thomas D Mackenzie1,2,3

Abstract

Background: Most studies of diabetes self-management that show improved clinical outcome performance involve multiple, time-intensive educational sessions in a group format. Most provider performance feedback interventions do not improve intermediate outcomes, yet lack targeted, patient-level feedback.

Methods: 5,457 low-income adults with diabetes at eight federally-qualified community health centers participated in this nested randomized trial. Half of the patients received report card mailings quarterly; patients at 4 of 8 clinics received report cards at every clinic visit; and providers at 4 of 8 clinics received quarterly performance feedback with targeted patient-level data. Expert-recommended glycemic, lipid, and blood pressure outcomes were assessed. Assessment of report card utility and patient and provider satisfaction was conducted through mailed patient surveys and mid- and post-intervention provider interviews.

Results: Many providers and the majority of patients perceived the patient report card as being an effective tool. However, patient report card mailings did not improve process outcomes, nor did point-of-care distribution improve intermediate outcomes. Clinics with patient-level provider performance feedback achieved a greater absolute increase in the percentage of patients at target for glycemic control compared to control clinics (6.4% vs 3.8% respectively, Generalized estimating equations Standard Error 0.014, p < 0.001, CI -0.131 - -0.077). Provider reaction to performance feedback was mixed, with some citing frustration with the lack of both time and ancillary resources.

Conclusions: Patient performance report cards were generally well received by patients and providers, but were not associated with improved outcomes. Targeted, patient-level feedback to providers improved glycemic performance. Provider frustration highlights the need to supplement provider outreach efforts.

Trial Registration: ClinicalTrials.gov: NCT00827710
Study Aim

- To improve quality of care provided to adult patients with diabetes through the use of information from an integrated diabetes registry.
  - Distributed an individualized report card to patients both at home on a quarterly basis and at each primary care visit.
  - Distributed report cards quarterly to providers at all clinics: standard report cards at 4 of 8 clinics, and enhanced report cards at the other 4 of 8 clinics.
  - Developed an interface to report card data and made available to the clinical team at the point of care.
Intervention

- **Design**: Nested randomized trial
  - 5,457 adult patients with diabetes at 8 federally qualified community health center clinic sites
    - Randomized at patient level for mailed report cards
    - Randomized at clinic level for point-of-care interventions
Methodological Approach

- **Quantitative:**
  - Process outcomes
    - Appointment and self management goal setting
  - Intermediate health outcomes (HbA1c, BP, LDL)
    - Assessed at patient, provider, and clinic levels

- **Data collection:**
  - Lab data from clinical systems
  - Click-through data on point-of-care report cards
  - Patient responses to structured survey items
Methodological Approach

Qualitative:
- Provider perception of intervention program (satisfaction level, opinions, recommendations)
- Patient perception of intervention program (satisfaction level, opinions, recommendations)

Data Collection:
- Provider interviews
- Provider focus group
- Patient responses to open-ended survey items
Process outcomes were not improved by the intervention; patients who received mailed report cards were less likely to schedule BP and HbA1c testing than the control group.

Patients receiving point-of-care report cards performed worse than control patients on glycemic and blood pressure targets; no difference in lipid performance detected.

Provider enhanced report cards were associated with significant improvement in glycemic control at both clinic and patient levels.

Both patients and providers expressed satisfaction with report card potential to motivate behavioral change; providers also noted some feelings of competition and frustrations with performance feedback.
Lessons & Considerations

- Complex analyses and counterintuitive results
  - Differences between clinics (patient populations and clinic processes) even in the same system
  - Multiple competing interventions in the same clinical space can muddy the waters
  - Qualitative data provided necessary insight to contextualize quantitative results
Care by Cell Phone: Text Messaging for Chronic Disease Management

Henry H. Fischer, MD; Susan L. Moore, MSPH; David Ginocar, MD; Arthur J. Davidson, MD, MSPH; Cecilia M. Rice-Peterson, RN, BSN; Michael J. Durfee, MSPH; Thomas D. MacKenzie, MD, MSPH; Raymond O. Estacio, MD; and Andrew W. Steele, MD, MPH, MSc

Objectives: To assess the feasibility of engaging adults with diabetes in self management behaviors between clinic visits by using cell phone text messaging to provide blood sugar measurement prompts and appointment reminders.

Study Design: Quasi-experimental pilot among adult diabetic patients with cell phones who receive regular care at a federally qualified community health center in Denver, Colorado, which serves a population that is predominantly either uninsured (41%) or on Medicaid or Medicare (55%).

Methods: Patients (N = 47) received text message prompts over a 3-month period. Blood sugar readings were requested 3 times per week (Monday, Wednesday, and Friday). Reminders were sent 7, 3, and 1 day(s) before each scheduled appointment. Acknowledgments were returned for all patient-sent messages. Focus groups were conducted in English and Spanish with selected patients (n = 8).

Results: Patients of all ages were active participants. Correctly formatted responses were received for 67.3% of 1565 prompts. More than three-fourths (79%) of the cohort responded to more than 50% of their prompts. The appointment analysis was underpowered to detect significant changes in attendance. Participants reported increased social support, feelings that the program "made them accountable" and increased awareness of health information. Two-thirds (66%) of patients provided glucose readings when prompted during the study, compared with 12% at 2 preceding clinic visits.

Conclusions: For certain patients, cell phone-based text messaging may enhance chronic disease management support and patient-provider communications beyond the clinic setting.

Study Aim

- Evaluate feasibility of improving care for adult patients with diabetes through use of cell phone text messaging to provide appointment reminders and chronic disease support between clinic visits
**Design:** Quasi-experimental pilot study

- 47 adult patients with diabetes
  - Cell phone users with glucometers
  - English or Spanish as primary language
- 3-month intervention period
  - Blood sugar requests by text 3x week (M,W,F)
  - Appointment reminders by text 7, 3, 1 day(s) prior
Methodological Approach

- **Quantitative:**
  - Appointment attendance
  - Patient engagement with intervention
    - Text message responses received
    - Mean message response times
    - Message response rates

- **Data collection:**
  - Appointment no-show rates from clinical data systems
  - Message response data from electronic intervention system
Methodological Approach

- **Qualitative:**
  - Patient perceived self-efficacy
  - Patient perception of intervention program (satisfaction level, opinions, recommendations)

- **Data Collection:**
  - Focus groups
    - Conducted in English and Spanish
Study Results

- Patients were active participants
  - 67.3% of 1585 prompts received responses
  - 79% of patients answered >50% of their prompts
  - 66% of patients provided glucose readings in response to prompts, compared with 12% at 2 prior clinic visits
  - Analysis was underpowered to detect changes in appointment attendance

- Patients reported increased social support, feeling the program “made them accountable,” and increased awareness of health information.
Mixed Methods Design: Sequential

ACTION Contract No. 290-2006-00-20, Task Order No. 8: Improving the Measurement of Surgical Site Infection (SSI) Risk Stratification and Outcome Detection

FINAL PROJECT REPORT

AHRQ Task Order Officer: Kendall K. Hall, MD, MS, FACEP
CDC Technical Officer: Sandra Berrios-Torres, MD

Submitted by

DENVER HEALTH
Level One Care for ALL

In collaboration with:
Intermountain Healthcare
Salt Lake City VAMC
Vail Valley Medical Center

Principal Investigators:
Connie Savor Price, MD
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October 31, 2011
Study Aims

- Design and test methods to risk stratify on data elements available for electronic collection
- Assess acceptance of risk stratification and electronic surveillance among surgeons and infection preventionists
- Use electronic detection algorithms to determine SSI rates for selected procedures in 4 unique hospital settings
Methodological Approach

- **Quantitative:**
  - Create risk stratification dataset from identified and defined potential risk factors
  - Create, train, test, and validate an electronic algorithm for SSI detection

- **Data collection:**
  - Analytic union dataset of 34 risk factors electronically available at all health system sites
  - Training dataset (VASQIP data)
Methodological Approach

Qualitative:
- Surgeon acceptance of risk stratification models and identification of SSI risk factors (pre)
- Infection preventionist acceptance of electronic surveillance tool (post)

Data Collection:
- Focus groups
  - Surgeons
  - Infection prevention nurses
- Chart review for algorithm validation
Study Results

- Surgeons feel that current risk adjustment models are inadequate
- IPs receptive to concept of electronic triage with human adjudication
  - Needs to be adaptable to variety of systems, low/no cost
  - Demonstrate time savings in day-to-day work
- A risk-stratified dataset was successfully created, but missing values in laboratory test fields affected electronic surveillance
- Algorithm sensitivity of 99.8% comparable to manual surveillance; specificity of 41.5% lower than hoped
  - Increasing postoperative surveillance duration improved results
  - Key data stored in free-text clinical notes (inaccessible to algorithm)
Considerations in Delivery Systems

- Institutional knowledge/assets can aid research efforts
  - Ask health system contacts about existing data sources

- Provider time is a limiting factor
  - Take advantage of standing meeting opportunities to conduct focus groups, if possible
  - Be prepared to conduct interviews on-site; early, late, or over lunch in break rooms and with interruptions

- Project perceptions can be sensitive subjects
  - Confidentiality and trust are key, both for present and future projects
  - Translation into practice: will your project be implemented in the system if successful?
Considerations in Delivery Systems

- Conducting focus groups with patients:
  - Clear communication with patient participants
    - Researcher vs. caregiver roles
    - Focus of group discussion vs. communication about patients’ individual care concerns
    - Consider working with medical interpreters
  - Location, timing, and convenience
    - Reserve space in the delivery setting if possible
    - Make sure personnel on-site are aware that day about what your group is for and where you’re holding it
Considerations in the Safety Net

Working with priority populations

- Racial and ethnic minorities; the uninsured and low-income groups with limited resources
  - At Denver Health:
    - 65% of patients below 185% of the federal poverty level
    - Over 50% of patients are on Medicaid or uninsured
    - Over 70% of patients represent racial and ethnic minorities

- Increased distrust and suspicion of research
- Importance of cultural competency
- Issues of health literacy and numeracy
- Appropriate incentives in resource-limited settings
How conducting mixed-methods research can sometimes feel:
Thank you!

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