Key Considerations for Survey Research

Breakout Session

Aditi Rao, PhD, RN
Director of Nursing Practice & Magnet Practice Director
Hospital of the University of Pennsylvania

December 2016

Introduction

Survey research: common method of measurement/ data collection

- Have you ever asked someone to take a survey?
- Have you ever taken a survey?
- What were these surveys about?
- Why do researchers utilize surveys?

Survey Research: An Overview

- **Survey research consists of asking respondents questions**
  - Questionnaire– paper and pen, web-based, telephone
  - One-on-one interviews
- **Method used to elicit feedback and/or assess beliefs**
- **Before administering a survey, researchers must first define the research question and concept(s) to be studied**
- **Once researchers decide to administer a survey, they must consider:**
  - What survey method to use?
  - Which survey instrument to use?
  - How to construct the survey?
  - How to ensure validity/ reliability?
  - Advantages/ Disadvantages of the method?

Where do you start?

- **Consider your research question:**
  - Who are you aiming to study? → population of interest
    - e.g., nurses, healthcare workers, patients, caregivers?
  - What do you want to know about them? → concept of interest
    - e.g., nurses' perceptions about their work environment
    - e.g., patients' perceptions of preparedness for surgery
    - e.g., caregivers' feelings of fatigue

- **Conduct a literature review:**
  - What is already known about this population?
  - What work has already been done in this area?
    - How have researchers defined this concept in previous studies?
    - Is there an existing instrument that can measure your concept?

- **If a relevant instrument exists, ADAPT it!!!**

Why adapt an existing instrument?

- **Creating a survey requires careful thought to ensure that you are measuring what you intend to measure**
- **Adapting an existing instrument that has already been carefully designed and tested saves you some of the initial steps**
- **Using existing instruments also allows for better comparison between published studies**
- **But… if you can't find an instrument that truly measures what you're studying, you may have to create your own**

Decision: What survey method to use?

To decide on a questionnaire or interviews, consider:

- **Population: Group of people you aim to better understand**
  - Can population be enumerated?
  - Is the population literate?
  - Are there any language issues?
  - Will the population be willing to participate?
  - What are the geographic restrictions?

- **Sample: Subset of the population you will be try to access**
  - What data is available? (i.e., contact info)
  - Can respondents be located/ contacted?
  - Who is the respondent? (i.e., nurses, CNAs, patients, families?)
  - Can all members of the population be sampled? How will you access them?
  - Will response rates pose a challenge?

Decision: How to construct the survey?

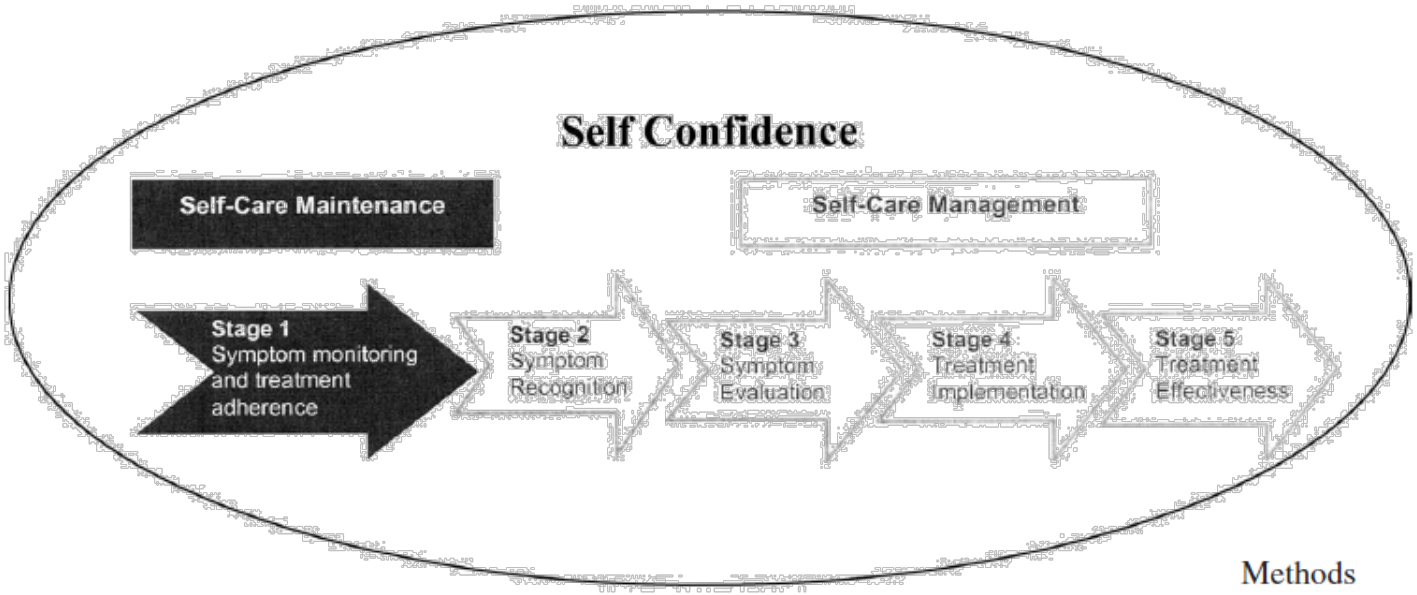
To construct the survey, you must consider:

- **Content: What will you ask?**
- **Wording: How will you ask?**
- **Format: How will you structure the responses?**
- **Placement: How will you sequence the questions?**

Content: What will you ask?

Step 1: Identify and map out your concept(s)

- **Questions should be derived from the concept of interest**
- **Concept: abstract idea**
- **Clearly defined concepts will help you focus your questions**



Journal of Cardiac Failure Vol. 10 No. 4 2004

Methods

Psychometric Testing of the Self-Care of Heart Failure Index

BARBARA RIEGEL, DNSc, RN, CS, FAAN,[1,2] BEVERLY CARLSON, MS, RN, CNS, CCRN,[2] DEBRA K. MOSER, DNSc, RN,[3] MARGE SEBERN, PhD, RN,[4] FRANK D. HICKS, PhD, RN,[5] AND VIRGINIA ROLAND, MSN, RN, CS[6]

Philadelphia, Pennsylvania; San Diego, California; Lexington, Kentucky; Milwaukee, Wisconsin; Chicago, Illinois; Saginaw, Michigan

Wording: How will you ask?

Step 2: Begin generating survey items, considering:

- **Is question useful: Ask fewest number of questions possible**
- **Is the question clear: Use unambiguous, specific terms**

  For example: instead of asking, “How well did you like the book?” you could ask, “Did you recommend the book?”
- **Are additional questions needed: Avoid double-barrels**

  For example: instead of asking, “How often do you experience distress and sadness about your health condition?” you should split them up
- **Is question biased: Avoid leading questions**

  For example: instead of only asking, “What are the advantages of a single payer system?” you would also want to ask about disadvantages

Format: How will you structure responses?

Step 3: Develop the questions, considering:

- **Question type: structured vs. unstructured**
  - Structured: People have defined responses from which to choose
    - Dichotomous: 2 choices
    - Nominal or categorical: 3 or more choices
    - Ordinal: Rank ordering several choices
    - Interval: Measure levels, i.e., Likert scaling
  - Unstructured: open-ended
- **Response format**
  - Fill in the blank (e.g., name, age)
  - Single choice option (e.g., unit, role)
  - Multi choice option (e.g., comorbid conditions)
  - Unstructured (e.g., free text fields)

Placement: How will you sequence?

Step 4: Decide on the order of the questions, considering:

- Are answers influenced by prior questions?
- Does question come too early or late to pique respondents' interest?
- Does question receive enough attention?

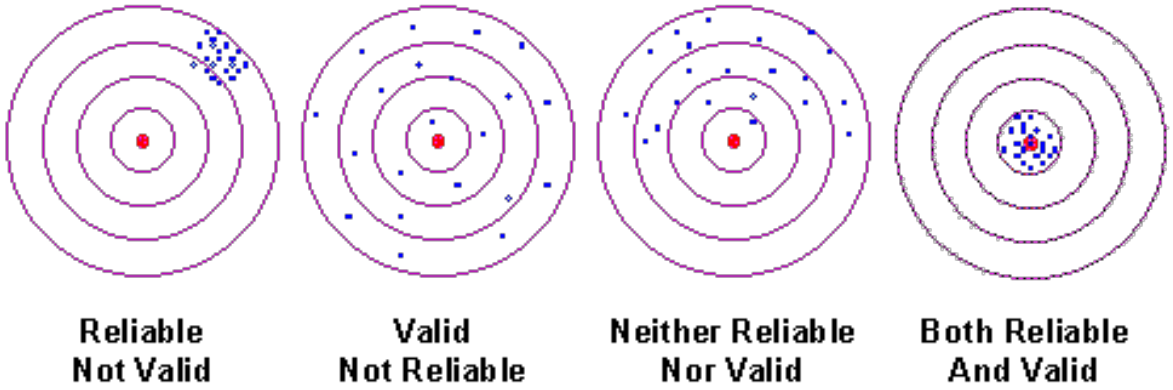
Rules of Thumb:

- **Start with easy, nonthreatening questions**
- **Put difficult questions toward the end**
- **Do not start with open-ended items**
- **Ask about one topic at a time**
- **Use transitions between topics**
- **Use contingency questions to allow respondents to skip irrelevant items in a logical order**

Ensuring Validity/ Reliability

Step 5: Once survey is drafted, consider how you will establish validity and reliability

- Validity: Does the instrument measure what it's supposed to?
- Reliability: Is the instrument consistent in the way it measures?



- **Prior to, during, and following administration of the survey, you can assess different types of validity and reliability**

Types of Validity

Construct validity: extent to which study questions reflect theoretical constructs they intend to

- Face validity: On its face, does survey appear to accurately reflect the constructs it should?
- Content validity: Do survey questions reflect content they should based on established criteria/ definitions?
- Predictive validity: Does survey predict something it should be able to predict?
- Concurrent validity: Does survey distinguish between groups it should be able to distinguish?
- Convergent validity: Do survey results correlate with theoretically similar measures?
- Discriminant validity: Do survey results diverge from theoretically dissimilar measures?

Types of Validity

Timing	Prior		During Criterion-Related		After Construct Validity	
	Face Validity	**Content Validity**	**Concurrent Validity**	**Predictive Validity**	**Convergent/ Discriminant**	**Factor Analysis**
Description (Action)	Experts inspect items	Experts inspect and rate relevance of items	Concurrently administer "gold standard" instrument with new instrument and correlate responses	Correlate score(s) from new instrument with another criterion measure	Compare groups with known high and low amount of the attribute	Analyze all responses to identify item groupings or subscales
Rationale	Assesses items for face value	Assesses relevance of items to concepts of interest	Measures how well instrument correlates with "gold standard"	Measures if scores on new instrument predict scores on another criterion at the same time or in the future	Determines if instrument can detect statistically significant differences between groups	Determines extent that an instrument measures concept(s) of interest
Test Measure(s)	No statistic	Content Validity Index (CVI)	Correlational Statistics	Correlational Statistics	Group Comparison Statistics	Factor Analysis Statistics

Types of Reliability

- **Inter-rater reliability: Degree to which different raters give consistent estimates of same observation**
- **Test-retest reliability: Assess consistency of a measure from one time period to another**
- **Parallel forms reliability: Assess consistency of results of two similarly designed tests**
- **Internal consistency reliability: Assess consistency of results within a test**

Timing	Prior	During		After
	Interrater Reliability	**Test-retest Reliability**	**Parallel Forms Reliability**	**Internal Consistency Reliability**
Description (Action)	Assess agreement of 2+ raters with same respondents and correlate responses	Administer instrument on 2 separate testing occasions (days or weeks apart) and correlate responses	Concurrently administer "gold standard" instrument with new instrument and correlate responses	Obtain Cronbach's alpha using all data from all respondents and examine the Cronbach's alpha if each item is deleted
Rationale	Acceptable agreement between or among raters must exist to reduce errors with data collection	Determines stability of performance of an instrument	Determines equivalence of an instrument to another similar measure	Measures how well one item predicts the response to another, and can identify "bad" items
Test Measure	Correlation Coefficient	Correlation Coefficient	Correlation Coefficient	Cronbach's alpha

Prior to Administration:Validity & Reliability

Before survey administered to full sample, assess:

- **Face Validity**
  - Confidence gained from careful inspection of the concept “on the face”
  - Does not alone provide convincing evidence of measurement validity; crudest form of validity

- **Content Validity**
  - Establishes that a measure covers the full range of concept meaning
  - Researchers may:
    - Solicit **the opinions of experts**
    - Verify with literature to ensure all aspects or dimensions of the concept

- **Interrater Reliability**
  - Establishes agreement between raters who may be conducting survey interviews

Face Validity

- **Instrument is examined by:**
  - Experts in the field
  - End users
- **Each item is inspected for its appropriateness to the construct being measured**
  - Wording
  - Clarity
  - Relevance
- **Instructions must be reviewed for clarity**
- **Researchers can use:**
  - Focus groups
  - One-on-one assessments
- **Questionable item should be further evaluated**

Content Validity

- **Instrument examined by experts in the field**
- **Items rated for relevance to the concepts being measured**

The scale items shown below have been developed to measure one dimension of the construct of safe sexual behaviors among adolescents, namely **assertiveness.** Please read each item and score it for its relevance in representing this concept.

Assertiveness is defined as the use of verbal and interpersonal skills to negotiate protection during sexual activities.

Item	Relevance Rating: Not Relevant	Somewhat Relevant	Quite Relevant	Highly Relevant
1. I ask my partner about his/her sexual history before having intercourse.	1	2	3	4
2. I don't have sex without asking the person if he/she has been tested for HIV/AIDS.	1	2	3	4
3. When I am having sex with someone for the first time, I insist that we use a condom.	1	2	3	4
4. I don't let my partner talk me into having sex without knowing something about how risky it would be.	1	2	3	4

Please comment on any of these items, including possible revisions or substitutions, or your thoughts about why an item is not relevant to the concept of assertiveness. Please suggest any additional items you feel would improve the measurement of assertiveness relating to adolescents' safe sexual behaviors.

During Administration: Validity & Reliability

Pilot survey with sample to further establish reliability:

- **Test-retest reliability:**
  - Administer same test to same sample on 2 separate occasions, then correlate scores
  - Correlation coefficient (range -1 to +1) should be > 0.8 to indicate good test-retest reliability

- **Parallel forms reliability:**
  - Administer gold standard instrument, same time as new instrument
    - Instruments should be similar
    - Gold standard will have established reliability and validity
  - If two sets of responses are similar parallel forms reliability is established

After Administration: Validity & Reliability

Once survey is administered to full sample, analyze all data to establish validity & reliability:

- **Internal consistency:**
  - Analyze data to obtain Cronbach's alpha statistic
  - Cronbach's alpha of ≥ 0.80 is desirable, but ≥ 0.7 is often accepted
  - Instrument subscale items may have alphas ≥ 0.60
  - Allows researchers to identify "good" and "bad" items

- **Criterion validity: concurrent & predictive validity**
  - Select alternate measure to be conducted at the same time
  - Assess how closely related instrument scores are to selected measure
  - Example: self-report of alcohol consumption correlated with blood or urine tests

After Administration: Factor Analysis

- **Exploratory factor analysis: identifies instrument subscales**
- **Conducting factor analysis yields:**
  - Factor structure: how many factors
  - Factor loadings: how questions cluster together

Table 4. Rotated Factor Component Matrix and Factor Loadings for Continuous Level Variables

	Factor Components				
Total Items Retained 18	1	2	3	4	5
Name of Subscale	Affective	Pain Severity and Sleep Interference	Perceptions of care	Activity Interference	Adverse Effects
Variance explained Total 64.05%	31.36%	11.23%	8.42%	6.9%	6.14%
Cronbach Overall 0.86	0.82	0.83	0.70	0.82	0.63
Least pain in 24 hours	−.035	.528	−.450	.235	.162
Worst pain in 24 hours	.200	.535	−.151	.420	.130
Estimate of percentage of time in severe pain	.029	.627	−.406	.317	.139
Pain interfered or prevented you from activities in bed	.135	.229	−.074	.791	.068
Pain interfered or prevented you from activities out of bed	.194	.203	−.110	.807	.073
Pain interfered or prevented you from falling asleep	.343	.822	−.010	.089	.102
Pain interfered or prevented you from staying asleep	.268	.812	−.068	.090	.064
How much the pain caused you to feel anxious	.734	.227	−.126	.224	.021
How much the pain caused you to feel depressed	.745	.209	−.240	−.067	.129
How much the pain caused you to feel frightened	.804	.151	−.190	.014	.098
How much the pain caused you to feel helpless	.673	.097	−.134	.403	.182
Severity of nausea	.138	.140	.079	.026	.713
Severity of drowsiness	.079	.024	−.024	.304	.694
Severity of itching	−.217	.013	.069	.397	.460
Severity of dizziness	.138	.132	−.063	−.124	.762
Pain relief in the first 24 hours (%)	−.176	−.143	.699	−.117	−.078
Were you allowed to participate in decisions about pain treatment?	−.167	−.017	.745	−.005	−.025
How satisfied are you with the results of your pain treatment?	−.195	−.147	.794	−.028	.050

Advantages/ Disadvantages

- **Advantages:**
  - Efficient, cost-effective method for gathering data from a broad sample
  - Can allow researchers access to geographically dispersed members of a population

- **Disadvantages:**
  - Survey development is time consuming and requires rigorous analytic methods
  - Survey fatigue must be assessed
  - Surveys must be carefully constructed

Key Takeaways

- Always begin with a literature review to clearly define concept of interest
- Search for existing instruments that can be utilized or adapted
- If no instruments exist, design an instrument with consultation from an expert in instrument development
- Draft questions with careful consideration of content, format, wording, and sequence
- Pilot instrument to ensure it's clear– establish face & content validity
- Have a plan to further establish validity & reliability during and after administration of the survey


CARE
LEAD
INNOVATE
MAGNET
RECOGNIZED
AMERICAN NURSES
CREDENTIALING CENTER