Descriptive Quantitative Approaches Part 2

1. Descriptive Quantitative Approaches to Human Response and Meaning Validity and Reliability

1.1 Descriptive Quantitative Approaches

Notes:

Descriptive Quantitative Approaches to Human Response and Meaning Part II Measurement Validity
1.2 Learning Outcomes

Learning Outcomes
In this Presentation you will learn to:

☑ Describe validity and reliability of descriptive quantitative design

Notes:

• Describe validity and reliability of descriptive quantitative design
1.3 Descriptive Quantitative Design

Descriptive Quantitative Design
Validity and Reliability

Descriptive statistics of the participants should be provided!

Notes:
Descriptive Quantitative Design
Validity and Reliability
Did they ask the right people?
Did they describe their subjects sufficiently? Descriptive statistics of the participants should be provided, see next slide for example.

• And does your patient match the people they asked?
• If I wanted to know lived experience of patients who have heart failure, I should ask people who have heart failure not any cardiac patients!!!
• How do patient express their satisfaction to the care they received from the surgeon or CRNA or NP?
1.4 Type of Research Designs

Notes:
Type of Research Designs
Systematic Review of Descriptive Studies
Descriptive (quantitative) Study
Case Study
Clinical Observations
1.5 Descriptive Quantitative Study

Notes:

- Descriptive Quantitative Study
- No random assignment
- No control or treatment groups
  - Descriptive quantitative design is common
  - Systematic review of descriptive quantitative study
  - Cross sectional studies
  - Survey methods using validated questionnaire
1.6 Type of Descriptive Statistics

Notes:

What Type of Descriptive Statistics
Central Tendency
- Mode, Median, Mean
- Percentages
Variance or Spread
- Standard Deviation
Relative Risk
- Risk of a case in one group compared to another group
Correlation between human response and other variables
Regression analysis - Examine if a human response predicts a result
1.7 Quantitative Design: Measurement

As with therapy and harm questions, measurements can be continuous or categorical. More likely to see Likert type scales or other questionnaire were the scores are summed.

Key to remember is; Did they measure accurately?

- Need to fully understand how the variables are defined and measured
- Need to understand if the instrument used for measurement is valid and reliable.
- Did they measure what it is suppose to measure? Eg. Use depression questionnaire to measure depression
- Need to understand clinical relevance
2. Measurement Categories

2.1 Yes or No Questionnaire

<table>
<thead>
<tr>
<th>No</th>
<th>Items Description</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do you feel pretty worthwhile the way you are now?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Do you often get bored?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Do you often feel helpless?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Are you basically satisfied with your life?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Do you prefer to stay at home rather than going out and doing new things?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Are you in good spirits most of the time?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Are you afraid that something bad is going to happen to you?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Do you feel that your life is empty?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Do you feel happy most of the time?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Do you feel full of energy?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Do you think it is wonderful to be alive now?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Do you feel that your situation is hopeless?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Have you dropped many of your activities as no longer interesting?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Do you think that most people are better off than you are?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Do you feel that you have more problems with your memory than most?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Geriatric Depression Scale (GDS-15)
Example of a Yes and No questionnaire
2.2 Likert Scale Questionnaire

Notes:

Likert Scale Questionnaire
The scale is named after its inventor, Rensis Likert, a psychologist. It captures variation in the phenomenon studies. Likert scaling assumes that distances on each item equal. Researchers create Likert scale questionnaires to fit the phenomenon of interest and validate by testing the questionnaire.

- Respondents specify their level of agreement or disagreement on a symmetric agree-disagree scale (strongly disagree to strongly agree)
2.3 Likert Scale

Notes:

Likert type scale are also scored according to categories. How often a practice or intervention had occurred or used (never, once a day, once a week, once a year) or used somewhat - used quite a bit - used often)

Measure disability states or grade the severity of disease
(none- mild- moderate-sever- extremely severe)

Measure frequency of an incidence
(Never to frequently), even more specific as (never- 1-2 times a week-daily)

Rate and evaluate academic performance
Poor-fair-Moderate-good-excellent)

Rate the level of interest
(Not interested at all- very much interested)
2.4 Cumulative Illness Rating Scale

[Image of a Likert scale]

Example of a Likert scale
Cumulative Illness Rating Scale

Please read each of the following organizations and indicate how impaired each is based on the scale above. Please circle one answer.

- Bi: Cardiac (heart only)
- Bi: Hip (knee, hip, or both)
- Bi: Brain (brain or spinal cord)
- Bi: Musculo-Dermal (muscles, bones, skin)
- Bi: Neurological (brain, spinal cord, nerves, or not include dementia)
- Bi: Endocrine-Metabolic (includes diabetes, simple infections, delirium, etc)
- Bi: Psychiatric/Behavioral (includes depression, anxiety, agitation, psychosis, not dementia)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi: Cardiac</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Bi: Hip</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Bi: Brain</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Bi: Musculo-Dermal</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Bi: Neurological</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Bi: Endocrine-Metabolic</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Bi: Psychiatric/Behavioral</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Notes:
No audio

2.5 Ways of Coping Questionnaire

[Image of Ways of Coping Questionnaire]

Ways of Coping Questionnaire (WCQ)

Inventory Booklet

Individuals respond to each item on a four-point Likert scale, indicating the frequency with which each strategy is used:

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does not apply and/or not used</td>
<td>Used Somewhat</td>
<td>Used quite a bit</td>
<td>Used a great deal</td>
</tr>
</tbody>
</table>

Example Statements

A. I talked to someone to find out more about the situation
B. I criticized or lectured myself
C. I tried not to think about my disease, but leave things open somewhat
D. I hoped for a miracle
E. I went along with fate, sometimes I just have bad luck

http://www.mindgarden.com/product/ways.htm

Notes:
No audio
2.6 Measurement Validity

Notes:

Validity reports if the measurement tool selected is appropriate and measured what it is intended to measure.

Face Validity - Does the instrument measures what it is intended to measure. It is the face value of the measure. Often contrasted with content validity. E.g., Depression scale is intended to measure depression.

Content Validity - the degree to which an instrument or measure has an appropriate sample of items for the construct (e.g., Hamilton's Depression scale (HDS)- what good it is if it only measures affective domain of depression?

or approved. HDS converged well with DSM IV criteria (which is gold standard for diagnosing depression.

Predictive Validity: HDS predicts depression similar to Becks Depression Inventory (BDI)

Criterion validity - involves determining the relationship between an instrument or measure and an external criterion variable representative of the construct. Has was compared with DSM-IV criterion

HDS became the gold standard to measure depression and all other scales used currently are measures for criterion validity using (HDS).
Layer 1 (Slide Layer)

Measurement Validity

Face

Does the instrument measures what it is intended to measure. It is the face value of the measure. Often contrasted with content validity. E.g., Depression scale is intended to measure depression

Layer 2 (Slide Layer)

Measurement Validity

Content

The degree to which an instrument or measure has an appropriate sample of items for the construct (e.g., Hamilton's Depression scale (HDS): what good it is if it only measures affective domain of depression?
Layer 3 (Slide Layer)

Measurement Validity

**Content Validity**

Involves determining the relationship between an instrument or measure and an external criterion variable representative of the construct.

HDS versus DSM-IV criterion.
HDS = gold standard to measure depression and all other scales used currently are measures for criterion validity using (HDS).

[Click each TAB]

Layer 4 (Slide Layer)

Measurement Validity

**Construct Validity**

- Construct Validity - the degree to which the instrument measures the construct under investigation. E.g., To what extend does HDS measures depression?

- Convergent Validity - Assesses the degree to which two methods of measuring a construct are similar, one being a gold stranded or approved. HDS converged well with DSM IV criteria (which is gold standard for diagnosing depression).

[Click each TAB]
2.7 Measurement Reliability

Notes:

The measurement tool selected is appropriate for the outcome.
Equivalence:
Hamilton Depression Instrument is administered by the health care provider. It is the subjective report of the therapist about the objective and self-report symptoms of depression.

One rater gives the patient 22
The other rater gives the same person a 20.

Is there a good inter-rater reliability??

Stability:
Hamilton Depression Instrument is administered by the health care provider. It is the subjective report of the therapist about the objective and self-report symptoms of depression.

Baseline Depression score for patient 22
3 months after score is 20.
Is there a good test-retest reliability??

Internal Consistency:
Consistency across multiple items in the questionnaire that measure the same attribute.
Measured and reported as Cronbach’s alpha.
Author/founder Lee Cronbach, a psychologist
Cronbach alpha gives the coefficient of internal consistency among the test items
Range from 0 to 99) above 0.7 is appropriate reliability.

Equivalence (Slide Layer)
Stability (Slide Layer)

Measurement Reliability

Stability

- Hamilton Depression Instrument: Administered by the health care provider.
  1. Subjective report about the objective
  2. Self-report symptoms of depression

Patient Baseline Depression score = 22
3 months after score = 20.

Is there a good test-retest reliability??

Click each TAB

Internal Consistency (Slide Layer)

Measurement Reliability

Internal Consistency

- Consistency across multiple items in the questionnaire that measure the same attribute.
  - Measured and reported as Cronbach’s alpha.
  - Author/founder Lee Cronbach, a psychologist
  - Cronbach alpha gives the coefficient of internal consistency among the test items
  - Range from 0 to 99: above 0.7 is appropriate reliability.

Click each TAB
2.8 Depression Measures Compared

<table>
<thead>
<tr>
<th>Hamilton Depression Scale</th>
<th>Beck Depression Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical threshold &gt;12</td>
<td>Clinical threshold &gt;12</td>
</tr>
<tr>
<td>Measures more physical components of depression</td>
<td>Measures more emotional components of depression</td>
</tr>
<tr>
<td>Varimax rotation in a meta-analysis 72%</td>
<td>Varimax rotation in a meta-analysis 76%</td>
</tr>
<tr>
<td>Average number of factors extracted 5.3 (SD1.6)</td>
<td>Average number of factors extracted 4 (SD 1.4)</td>
</tr>
<tr>
<td>Clinician fills it out</td>
<td>Participants fill it out</td>
</tr>
</tbody>
</table>


Notes:

Hamilton Depression Scale
Clinical threshold >12
Measures more physical components of depression
Varimax rotation in a meta-analysis 72%
Average number of factors extracted 5.3 (SD1.6)
Clinician fills it out

Beck Depression Index
Clinical threshold >12
Measures more emotional components of depression
Varimax rotation in a meta-analysis 76%
Average number of factors extracted 4 (SD 1.4)
Participants fill it out


2.9 All valid questionnaire or instrument are also reliable. Is the statement true or false?

(True/False, 10 points, 1 attempt permitted)
All valid questionnaire or instrument are also reliable. Is the statement true or false?

- True
- False

Correct (Slide Layer)

All valid questionnaire or instrument are also reliable. Is the statement true or false?

- True
- False

That's right! The correct answer is false. All valid questions may not be reliable.

Continue
2.10 Summary

In this Presentation you have learned to:

- Describe types of commonly used questionnaires to measure human response
- Understand validity and reliability of a questionnaire or measure

Notes:

In summary, we Described various types of commonly used questionnaires to measure human response such as the ones used yes and no responses, and several different Likert scales.

We also Understood validity and reliability of a questionnaire and that you are not expected to create a questionnaire rather identify a reliable questionnaire to use.
for your final paper.