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# Validity, Reliability, Rigor, & Trustworthiness

**NURS 485 – The Discipline and Profession of Nursing III**

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# How do we know if research is any good?



- Airy property with panoramic mountain views. Lots of green space and parking. Perfect for people who want privacy and independence!

# Different approaches

Quantitative =  
Validity and Reliability

Qualitative =  
Rigour and Trustworthiness

# Role of Appraisal

- Appraisal helps to assess the quality of a study
- ***There are always limitations in research.*** Do these limitations compromise the outcomes?
- Rigour is a key factor in appraisal
- Importance of research paradigm

# Validity and Reliability in Quantitative Research

# Reliability

- **Are your results consistent each time you measure?**
- If you measure a blood pressure and get 160/80, then check again in 5 min and get 90/30, your measurement is not reliable (*or your patient is in trouble!*)
- Results can be reliable across cultures, populations, timeframes
- If we do this again, will we get similar results?

# Instrument Reliability

Type of Reliability	What it Measures	Example Statistic
Stability	Result doesn't change over time	Pearson product moment correlations
Inter-rater reliability	People with the same experience have the same score	Cohen's kappa
Intra-rater reliability	A person has the same score if they do they test again (and nothing has changed)	Scott's pi
Consistency	Do all of these questions fit together as a group?	Cronbach's alpha

# Validity

- Are we actually measuring the thing we want to measure?
- ***Just because a scale is reliable does not mean it is valid***



# Validity

Type of Validity	Definition	Why would a study not be valid?
Statistical conclusion validity	Were tests appropriate and identified relationship between variables based on sound analysis and evidence?	<ul style="list-style-type: none"><li>• Small sample size</li><li>• Tools not accurately measuring variable</li><li>• Variation in implementation (i.e. not all participants get the same thing)</li></ul>
Internal validity	What happened is the result of the independent variable, not other reasons	<ul style="list-style-type: none"><li>• Unexpected factors that you can't control</li></ul>
Construct validity	The degree to which a tool measures the thing it is designed to measure	<ul style="list-style-type: none"><li>• Hawthorne/observational effect</li><li>• Researcher's interaction with participant can encourage certain responses</li><li>• Contamination not enough difference between control and experimental group</li></ul>
External validity	Generalizability of the results to other people/settings	<ul style="list-style-type: none"><li>• Phenomenon presents differently in other contexts</li></ul>

# Bias

- Factors that influence research decisions, possibly compromising the results
- Can come from both the research design and unexpected events

# Bias

Type of Bias	What Happens
Selection bias	Inadequate randomization procedures
Performance bias	Differences in the way the intervention was received or delivered
Attrition bias	More participants lost from one research group than another (control –v- intervention)
Participant bias	Lack of full disclosure/giving appropriate responses Lack of adherence to study protocol
Conceptual bias	Inappropriate conceptualization of the problem, interpretations of findings, or drawing inappropriate conclusions
Design bias	Faults in any aspect of the research design
Recall bias	Participants with difficulty recalling past events

# What do I check in a quantitative paper?

- Have researchers reported measurement of reliability (stability, consistency, inter-rater)?
- Have researchers reported any measurement of validity (e.g. construct validity)?
- Is there evidence of minimizing sources of bias or threats to validity?
- Use CASP tools for the appropriate method

# Rigour in Qualitative Research

# How do you tell if a qualitative study is good?

- There are a wide variety of frameworks and arguments about what constitutes quality
- Use a framework that is appropriate for your method

## General Principles

- Theoretical/purposive sampling: talk to experts in the phenomenon
- Constant comparison: each finding is compared to other findings
- Concurrent data collection and analysis: data collection strategy adjusts to reflect your findings as you go
- Thick description: Provide lots of detail, context, and interpretation for findings. Use participant quotes.
- Reflexivity: With the principle of “researcher as instrument”, reflect on the process you are having on the research... and that the research is having on you
- Audit trail: keep a record of your research decisions

# Trustworthiness (Guba, 1981)

Term	Definition	Sample Techniques
Credibility	Identify patterns and take account of the complexity of the situation	<ul style="list-style-type: none"> <li>• Prolonged engagement at site</li> <li>• Peer debriefing</li> <li>• Triangulation</li> <li>• Member checks</li> <li>• Constant comparison- compare each finding to all other findings</li> </ul>
Transferability	Findings are interpretive of a given context	<ul style="list-style-type: none"> <li>• Theoretical sampling</li> <li>• Thick description</li> </ul>
Dependability	Findings reflect current reality	<ul style="list-style-type: none"> <li>• Overlap methods</li> <li>• Replication</li> <li>• Audit trail</li> </ul>
Confirmability	Findings can be confirmed if process was replicated	<ul style="list-style-type: none"> <li>• Triangulation</li> <li>• Reflexivity</li> </ul>



## Other ideas

- Some authors argue that responsiveness and the spirit of the inquiry are more important than specific techniques
- No such thing as eliminating bias in qualitative work

# What do I check in a qualitative paper?

- Do the participants have experience in the phenomenon?
- Have they spent a lot of time with the topic? (interviews, observations, focus groups)
- Was there an analysis plan or framework?
- Are the findings described thoroughly, with participant quotes?
- Are the conclusions proportionate to the findings?

# Reporting Standards

- *Appraisal tools* look at whether a study is good after it is published
- *Reporting standards* are guidelines about including information in publications
- Both are too late- need to consider quality all the way through
- Consider when research was published

# Reporting Standards



Enhancing the **QUALITY** and  
**Transparency Of health Research**



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# Critical Appraisal Skills Program (CASP)

 **CASP Randomised Controlled Trials Checklist \*NEWLY UPDATED\***

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 **CASP Systematic Review Checklist**

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 **CASP Qualitative Studies Checklist**

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 **CASP Cohort Study Checklist**

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 **CASP Diagnostic Study Checklist**

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## Overall...

- As you read more research, ask “does this seem reasonable? Does this make sense?”
- If you think the answer is no... then it’s probably no!



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# Thank you!

For more information, go to [www.jenniferjacksonrn.org/](http://www.jenniferjacksonrn.org/)

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