Research At A Glance

Important Terms to Remember:

Term	Definition	Usage (as applicable)
Evidence-Based Practice	Using research evidence, practitioner experience, and client values/desires to make the best clinical decisions	As future practitioners, you want to make sure your practice is backed by credible research. This not only ensures that the patients get the highest quality of care, but also can cover you in cases of legal action.
Peer-review process	An appraisal process that uses experts in the field to determine whether or not an article should be published in a scientific journal	Important to make sure the best information is published
Informed Consent	Principle that states the patient must have sufficient information before making a decision about their care	All participants must fill out informed consent to be in a study
Effect Size	A statistic that describes the magnitude or strength of a statistic. It can refer to the magnitude of the difference, relationship, or outcome	A larger effect size indicates a greater difference, relationship, or outcome
Attrition	Loss of participants who have enrolled in a study. Attrition can occur for numerous reasons, including voluntary drop-out, relocation, or death. Also called mortality	It is important to look at attrition for a study. For example, if the authors are reporting that 100% of their participants showed statistical significance, but only 10 of the 50 participants were able to complete the experiment, then this article shows bias and decreased integrity.
Publication Bias	The tendency of scientific journals to publish positive findings and reject negative findings	
Confidence Interval	A reliability estimate that suggests a range of outcomes expected when an analysis is repeated	
PICO	A type of research question used to answer efficacy questions; includes population or problem, intervention, comparison, and outcome	Is CIMT or NDT more effective in regaining UE function for individuals that have had an MCA stroke compared to a Basal Ganglia stroke?

Values to Remember:

Term	Value	Definition
P Value (Statistical Significance)	$p < 0.05$	Expresses the probability that the result of a given experiment or study could have occurred purely by chance
Correlation Coefficient	Range is -1 to +1 -1 indicates a negative correlation (inverse relation) +1 indicated a positive correlation (linear relation)	Used to measure how strong a relationship is between two variables
Cronbach's Alpha	Typically a range from 0-1, the closer the Cronbach's Alpha coefficient is to 1.0, the greater the internal consistency	Measures internal consistency (how closely related a set of items are as a group)
Reliability	0 - 0.50 = poor reliability 0.50 - 0.75 = moderate reliability 0.75 - 1.0 = good reliability	The consistency and accuracy of a measure

Levels of Evidence

- Hierarchical approach that rates research from strongest to weakest
- Identifying the level of evidence can help to ensure that you are using the best information possible. For example, a peer-reviewed systematic review (Level I evidence) that has reviewed 50 articles, will provide you with more evidence-based information than an expert opinion (Level V evidence)

Level I	(Strongest): Systematic reviews and RCTs
Level II	Two groups, nonrandomized studies (e.g., cohort, case-control)
Level III	One group, nonrandomized (e.g., before and after, pretest and posttest)
Level IV	Descriptive studies that include analysis of outcomes (single subject design, case series)
Level V	Case reports and expert opinion that include narrative literature reviews and consensus statements

Types of Research

Qualitative	**Quantitative**
A type of research that studies questions about meaning and experience	A type of research that uses statistics and describes outcomes in terms of numbers

Research Designs

Experimental Designs	- The structure of experimental designs allow researchers to identify cause-and-effect relationships between independent and dependent variables	- **Types**: True experimental (RCTs), Quasi-experimental, Pre-experimental, and Single-subject design
Randomized Controlled Trial (RCT)	A type of research design that includes at least two groups (typically an experimental group and control group), and participant are randomly assigned to the groups	
Nonexperimental Designs	- Nonexperimental designs do not manipulate the independent variable and cannot determine cause-and-effect relationships	- **Types:** Descriptive (observation, surveys, and interviews), Evaluation research, and methodological research
Nonrandomized Controlled Trial	A study in which at least two groups are compared, but participants are not randomly assigned to groups; also called a quasi-experiment	
Case Reports	Describes a practice. Cannot identify cause-and-effect	- **Types:** Often focuses on a patient, group of patients, institution, facility, education program, definable units, patient management, ethical dilemmas, use of equipment or devices, or administrative or educational concerns

Types of Study

Prospective Study	Retrospective Study
A type of study that watches for an outcome on a group of individuals over a period of time Example: Effects of Parkinson's over time	A type of study that looks backwards and examines exposures to a suspected risk or protection factor in relation to an outcome Example: Reviewing medical charts to determine if a specific medication has a side effect

Validity

- In the case of a measure, the ability of that measure to assess what it is intended to assess. In the case of a study, when the conclusions drawn are based on accurate interpretations of the study findings and not confounded by alternative explanations
- Internal Validity: The ability to draw conclusions about casual relationships; in the case of intervention research, the ability to draw conclusions as to whether or not the intervention was effective
- External Validity: The extent to which you can generalize the findings of a study to other situations, settings, and measures

Criterion-Based Validity

Term	Definition	Usage
Concurrent Validity	Inferred interpretations are justified by comparing a measurement with supporting evidence that was obtained at approximately the same time as the measurement being validated was obtained.	- Measures how well a new test compares to an older test - Can also refer to concurrently testing two groups at one time - Ex. If a simple, inexpensive test has similar results to an expensive, elaborate test, than the simpler test can be used since they have good concurrent value
Predictive Validity	Inferred interpretations are justified by comparing a measurement with supporting evidence obtained at a later point in time.	- The extent to which a score on a scale or test predicts the score or value on some other variable in the future - There is usually little evidence to support predictive validity - Ex. Do preseason screenings of football players predict their performance?
Prescriptive Validity	Inferred interpretations of a measurement is the determination of the form of treatment a person is to receive.	- Refers to the capacity of an assessment to inform which intervention will have the best outcomes for a client

Theoretical Forms of Validity

Term	Definition	Usage
Construct Validity	The conceptual basis for using a measurement to make an inferred interpretation.	Is used to determine how well a test measures what it is supposed to measure
Content Validity	A theoretical form of validity that deals with the extent to which a measurement is judged to reflect the meaningful elements of a construct and not any extraneous elements	Assesses whether a test is representative of all aspects of the construct

Threats to Validity

Threat	**Definition**	**Example**
Assignment/Selection Threat	Groups are not equal on some important characteristics and usually occurs during the selection process	Demographics, illness/condition, medication
Maturation Threat	Changes in participants that naturally occur	Experiment completed on children with ASD- was it the experiment or them naturally maturing that caused the improvement?
History Threat	Something that changes between the pre test and post test that could account for the difference	A snowstorm affecting attendance A change in teacher or therapist
Testing/Practice Effect Threat	Performance measure changes due to exposure to some feature	If they're wearing a pedometer that they can see, they might try to walk more to get more steps
Order Effect Test	The order to which something is presented can cause a change	Completing testing after a long day of work, vs in the morning when they're wide awake and not exhausted

Types of Reliability

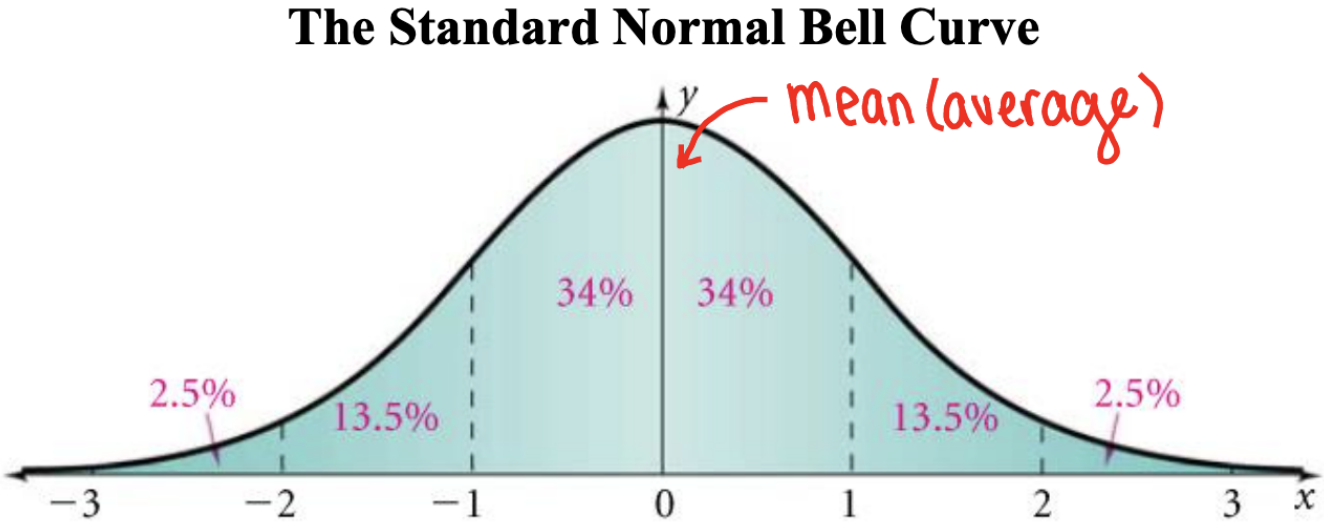
Test-Retest	Interrater	Intrarater
Measures the consistency of the same test over time	Refers to the reproducibility or consistency of decisions between two reviewers (or raters)	The consistency of the data recorded by one rater over several trials

Specificity Vs. Sensitivity

Specificity	The correct identification of individuals who do not have a condition
Sensitivity	The accurate identification of individuals who possess the condition of interest

Standard Deviation

Normal Distribution – shows data that vary randomly from the mean.
Normal Curve – The pattern the data form is a bell-shaped curve.



68% of the data fall within one standard deviation of the mean

95% of the data fall within two standard deviations of the mean

APA Citation References

Referencing journals articles: Examples

Material Type	In-Text Example	Reference List Example
Journal Article: Single author	"Black tea is the second most consumed beverage in the world after water" (Ruxton, 2016, p. 34). **OR** Ruxton (2016) suggests "Unsweetened tea can be part of a recommended diet" (p. 40). **Include page numbers for direct quotes.**	Ruxton, C. (2016). Tea: Hydration and other health benefits. *Primary Health Care*, *26*(8), 34-42. https://doi.org/10.7748/phc.2016.e1162 **Where a DOI is available it must be included at the end of the reference, in the format https://doi.org/10.xxxx**
Journal Article: 2 authors	... connection and optimism (Aspy & Proeve, 2017), but others contend ... **OR** Aspy and Proeve (2017) have found ... **Cite both authors each time the reference occurs.**	Aspy, D. J., & Proeve, M. (2017). Mindfulness and loving-kindness meditation: Effects on connectedness to humanity and to the natural world. *Psychological Reports*, *120*(1), 102-117. https://doi.org/10.1177/0033294116685867
Journal Article: 3 to 20 authors	... nurses must care as well as be competent (Geraghty et al., 2016). **OR** Geraghty et al. (2016) suggest ... **Cite only the surname of the first author followed by et al. and the year.**	Geraghty, S., Lauva, M., & Oliver, K. (2016). Reconstructing compassion: Should it be taught as part of the curriculum? *British Journal of Nursing*, *25*(15), 836-839. https://doi.org/10.12968/bjon.2016.25.15.836 **Provide the names of all authors in the reference list.**

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If the page names an individual author, cite their name first:

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Price, D. (2018, March 23). *Laziness does not exist*. Medium. **https://humanparts.medium.com/laziness-does-not-exist-3af27e312d01**