

How to Evaluate Evidence-Based or Research-Based Interventions

What is Scientifically Based Research?

- Consistent and reliable evidence that the intervention (practice, program, curriculum, etc.) has been proven to be effective.

Definitions

- Rigorous – thorough, meticulous, precise
- Systematic – methodical, orderly, regular, organized, logical
- Empirical - experimental
- Objective – impartial, neutral, unbiased, independent
- Reliability – confidence of the tool to produce the same results for the same person/group if the tool was used again or by another person
- Validity – extent to which the tool measures what it is supposed to measure

More Definitions

- Involves the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge
- Includes research that:
 - Employs systematic, empirical methods
 - Involves rigorous data analysis
 - Relies on measurements that provide reliable and valid data
 - Uses experimental or quasi-experimental designs
 - Ensures that studies are clear and detailed to allow for replication
 - Has been reviewed or accepted by independent experts

Evaluating Evidence-Based Practices

- Select criteria on which to evaluate the practices, treatment, or intervention before looking at the research
- Studies published in peer reviewed journals
 - Research is scrutinized by panel of experts who look at the adequacy of the methodology, soundness of conclusions, and contributions to scientific knowledge.
 - The editor gives feedback to the authors of the article to make recommendations for or against publication of the article.
 - Peer review increases the likelihood that reports are reliable and useful sources of information.
 - Peer reviewed reports are much more trustworthy than reports in popular media.

Evaluating Research

- Two types of research
 - Between groups studies
 - Single subject studies

Between Groups Approaches

- Randomized Clinical Trials (RCT) – participants are randomly assigned to one of two or more groups. One group receives treatment, another does not. Results are then compared. This design yields strong evidence for the efficacy of the intervention.
- Quasi-Experimental Designs – participants are matched on some characteristics and then randomly assigned to groups. This can yield important evidence of efficacy of an intervention. However, RCTs are still needed to confirm the results.

Single-Subject Design

- Compares baseline phase in which no intervention is implemented to one or more intervention phases. Data are collected continuously on outcome measures (improvement of skills, decline in behavior of concern, etc.). Consistent improvement on outcome measures during intervention compared to baseline indicate intervention was effective for that individual. Many replications of these outcomes over multiple individuals confirms that intervention is effective.
 - Multiple baseline across subjects, multiple baseline across behavior, multiple baseline across setting
 - AB designs are weaker research designs as another variable (not controlled for) may have made the changes observed

Data Analysis

- Statistical analysis of data –used for data analysis for group research design
- Linear graphical presentation –used for single subject design research

How to evaluate an intervention to determine if is supported by rigorous evidence

- Is the intervention backed by “strong” evidence of effectiveness?
- Quality + Quantity = “strong” evidence
 - Quality involves using well-designed studies
 - Quantity involves the number of trials or studies showing effectiveness (two or more settings, settings similar to yours)

If intervention is not backed by “strong” evidence, is it backed by “possible” evidence of effectiveness?

Types of studies that show “possible” evidence	Types of studies that do not show “possible” evidence
Randomized control trials whose quality/quantity are good but do not show “strong” evidence	Pre-post studies
Comparison groups studies in which intervention and comparison groups are matched very closely in demographics and other characteristics	Comparison group studies in which intervention and comparison groups are not matched closely
	“Meta-analysis” that include results of lower quality studies

- Whenever possible, interventions studies should be conducted in a double-blind, placebo control manner. In this design, neither the experimenter nor the participant know whether the participant is receiving the treatment or the placebo.
- It is also possible for the scientifically rigorous research to show that the intervention is **not** significantly better than control conditions (or better than the current gold standard treatment).

- Why use research for decision making?
 - Without research, we do not know if the intervention is effective or not. If we pick an ineffective intervention, it can have negative outcomes.
- Isn't all research the same?
 - No. Some scientists set up their studies in a way to confirm or disconfirm whether the intervention is effective. Others set up studies so that people cannot interpret the outcomes.

Important factors to consider when implementing evidence-based interventions

- Adhere closely to details of how it was implemented in the research
 - Are you implementing the intervention as it was described in the research? Did you leave out anything or add something that was not in the research?
 - Fidelity - accuracy in details, exactness
- Collect data to determine whether the intervention is effective for you

- Evidence based practices is more complicated than simply knowing what treatments are effective.
- Knowing what practices are effective is essential, other factors must also be taken into consideration.
 - Research findings (strength of evidence and benefits of various methods)
 - Professional judgment (collect data to determine if treatment is effective, additional literature, and the most recent research available)
 - Values and preferences (of the family, of the providers, etc.)
 - Capacity (proper training, adequate resources, and ongoing feedback about treatment fidelity)

Commonly Used Interventions

- **Established Research Base**
 - Family Assessment; Dunst
 - Parent Coaching; Julia Ann Woods
 - Applied Behavior Analysis
 - Antecedent Packages
 - Behavioral Packages
 - Comprehensive Behavioral Treatment for Young Children
 - Joint Attention Interventions
 - Modeling
 - Naturalistic Teaching Strategies
 - Peer Training Packages
 - Pivotal Response Treatment
 - Schedules
 - Self-management
 - Story-based Intervention Packages

Commonly Used Interventions

Emerging Research Base

Augmentative and
Alternative Communication
Devices
Cognitive Behavioral
Intervention Package
Developmental
Relationship-based
Treatment
Exercise
Exposure Package
Imitation-based Interaction
Initiation Training
Language Training

Peer-mediated
Instructional Package
Picture Exchange
Communication System
Scripting
Sign Instruction
Social Communication
Intervention
Social Skills Package
Structured Teaching
Technology Based
Treatment
Theory of Mind Training

Commonly Used Interventions

- **Unestablished**

- Auditory Integration Training
- Facilitated Communication Training
- Gluten- and Casein-Free Diet
- Sensory Integrative Package

References

- National Autism Center's National Standards Report
 - <http://www.nationalautismcenter.org/pdf/NAC%20Standards%20Report.pdf>
- <http://www.dpi.state.nd.us/title1/springwkshp/research.pdf>
- <http://www.asatonline.org/interventions/evaluate>
- What Works Clearinghouse
 - <http://ies.ed.gov/ncee/wwc/references/iDocViewer/Doc.aspx?docId=14&tocID=7>
- <http://www.quackwatch.com/>