ESTABLISHING EVIDENCE-BASED PRACTICES IN DISABILITY SERVICES

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Abstract

Article presents the theoretical understanding of usage of evidence-based practices in disability service promoting the most effective of practices. The details of identifying, promoting, and implementing EBPs involve a plethora of potentially problematic issues. Detail discussed purports of quality and quantity of the research describes wide application field of EBP. Criterion-based frameworks for determining effective or evidence-based practices could be used as a practical guide in disability services. The essential steps in determining whether a practice is evidence-based seem to be (a) locating the high quality, experimental research that examines the effectiveness of the practice and then (b) determining whether sufficient quantity of evidence showing that the practice causes improved outcomes exists are discussed as well.

Key words: *Evidence-based practices, issues of quality and quantity of the research, disability services.*

Problem of the research

A common concern among professionals who work with individuals with disabilities, their families, and the agencies that provide services to them is the gap between what research shows to be effective and what happens in day-to-day practices. Indeed, the research-to-practice gap seems to be as similar a concern in special education as it does in speech therapy, in rehabilitation counseling, and in adapted physical education.

To bridge the research-to-practice gap, scholars have focused recently on identifying, promoting, and implementing evidence-based practices – instructional approaches, therapies, and interventions shown by high quality research to result reliably in generally improved outcomes for the client or student. An evidence-based practice is one that is supported by a body of trustworthy research that, taken as a whole, demonstrates that the practice is highly likely to meaningfully improve outcomes for individuals with disabilities (Cook, Tankersley, & Landrum, 2009). Determining which practices are evidence-based practices requires a systematic approach to identifying those that are supported by a sufficient number of research studies that (a) are of high methodological quality, (b) use appropriate research designs that allow for assessment of effectiveness, and (c) demonstrate a meaningful body of results through which the cumulative results engender trust that the practice works (Cook et al., 2009).

The idea of evidence-based practices is not new, as criteria and standards for determining them have been developed and applied in other fields, most visibly in medicine (Sackett, Richardson, Rosenberg, & Haynes, 1997) and psychology (Chambless et al., 1998). Although

the use of evidence-based practices in disability services appears to hold great promise for promoting the most effective of practices, and, upon first consideration, even seems to be a straightforward enterprise, the details of identifying, promoting, and implementing EBPs involves a plethora of potentially problematic issues (Cook, Smith, & Tankersley, 2011). For example, questions regarding the types of research designs that can identify evidence-based practices, how many research studies are needed to identify a practice as evidence-based, and how methodological quality can be assessed are among the first questions that must be answered in order to determine which practices are evidence-based.

Object of the research: Establishing evidence-based practices in disability services.

Aim of the research: To discuss theoretical issues of establishing evidence-based practices in disability services.

Goals of the research:

1. to identify qualitative indicators of evidence based practices;
2. to identify quantitative indicators of evidence based practices;
3. to clarify meaning of Evidence-Based Practice process.

Theoretical issues of EBP as a method of research and method of cognition

Although all methods of research are useful and answer important questions, only a few research designs allow us to draw reliable conclusions about whether a particular practice *caused* improved outcomes (Lloyd, Pullen, Tankersley, & Lloyd, 2006). Only experimental studies (i.e., group experiments, quasi-experiments, and single-subject research) can demonstrate that changes in the independent variable cause changes in the dependent variable and provide evidence of the measured impact of a practice on an outcome. Research designs are uniquely suited to answer specific types of questions. Although qualitative designs and relational designs can answer other significant questions, they cannot answer questions related to whether a practice caused a change in learning, social interactions, physical movement, vocational skills, verbal exchanges, or other meaningful events of individuals with disabilities. Group experimental, quasi-experimental, and single-subject research designs can provide evidence of whether a practice is evidence-based.

To claim that a practice *causes* a change in individuals' outcomes, researchers must show that they have demonstrated *experimental control* in the application of the research design (L. Cook, Cook, Landrum, & Tankersley, 2008). Experimental control occurs when the research design has allowed researchers to account for and rule out any explanation for the change in the individuals' performance other than the use of the practice; that is, the only reasonable explanation for change is the use of the practice. Research designs that permit demonstration of experimental control can do so by systematically comparing the outcomes of a group who use the practice against a comparison (or control) group who does not use the practice or by systematically comparing individuals' performance with the practice in place against their performance when it is not used (Creswell, 2002; Rumrill & Cook, 2001).

Although no research design can completely rule out all alternative explanations for the results of applied research, some designs provide more confidence in establishing a cause/effect relationship than do others. By instituting a control group (or a control condition), randomly assigning participants experimental and control situations, and/or systematically and repeatedly introducing the intervention, experimental designs can result in reliable relationships among dependent and independent variables and allow researchers to assert their confidence that an intervention has influenced the outcome (L. Cook et al., 2008).

Quality of research

Determining the evidence-base of a practice not only requires that the research studies supporting the practice exhibit experimental control, but also that the studies are conducted with high quality. If research is not conducted properly, the results can be misleading at worse, or, at minimum, can be meaningless. Although there is not, as of yet, a clear consensus as to the methodological characteristics needed to ensure that experimental research in many disability service fields is rigorously conducted, several of the disability-focused disciplines have begun to propose or implement "quality indicators" for group experimental (Gersten et al., 2005; see Table1).

Table 1. Essential quality indicators of experimental designs proposed by Gersten et al. (2005)

Describing Participants
1. Was sufficient information provided to determine/confirm whether the participants demonstrated the disability(ies) or difficulties presented?
2. Were appropriate procedures used to increase the likelihood that relevant characteristics of participants in the sample were comparable across conditions?
3. Was sufficient information given characterizing the interventionists or teachers provided? Did it indicate whether they were comparable across conditions?
Implementation of Intervention and Description of Comparison Conditions
1. Was the intervention clearly described and specified?
2. Was the fidelity of implementation described and assessed?
3. Was the nature of services provided in comparison conditions described?
Outcome Measures
1. Were multiple measures used to provide an appropriate balance between measures closely aligned with the intervention and measures of generalized performance?
2. Were outcomes for capturing the intervention's effect measured at the appropriate time?
Data Analysis
1. Were the data analysis techniques appropriately linked to key research questions and hypotheses? Were they appropriately linked to the unit of analysis in the study?
2. Did the research report include not only inferential statistics but also effect size calculations?

At the same time several of the disability-focused disciplines have proposed or implemented "quality indicators" for single-subject research (Horner et al., 2005; see Table 2). Quality indicators are design characteristics that are important to address in order to have high confidence in the findings of the study. Said differently, using quality indicators of methodological quality, one can have the highest confidence in the findings of research studies that incorporate them into the designs; therefore, only high quality studies should be considered in determining whether a practice is evidence-based.

Certainly, the methodological rigor with which a study is conducted affects the confidence one can place in its findings. If the intervention was not implemented as designed, no meaningful conclusion can be drawn as to the effectiveness of the practice. To establish evidence-based practices for disability services, one of the first tasks of the research community must be to agree upon and systematically apply a set of quality indicators for methodological rigor, like those proposed by Gersten et al. (2005) and Horner et al. (2005), so that the quality of the research surrounding a practice can be evaluated.

Table 2. Essential quality indicators of single-subject designs proposed by Horner et al. (2005)

Describing Participants and Settings

1. Participants described with sufficient detail to allow others to select individuals with similar characteristics (e.g., age, gender, disability, diagnosis).
2. The process for selecting participants is described with replicable precision.
3. Critical features of the physical setting are described with sufficient precision to allow replication.

Dependent Variable

1. Dependent variables are described with operational precision.
2. Each dependent variable is measured with a procedure that generates a quantifiable index.
3. Measurement of the dependent variable is valid and described with replicable precision.
4. Dependent variables are measured repeatedly over time.
5. Data are collected on the reliability of interobserver agreement associated with each dependent variable, and IOA levels meet minimal standards (e.g., IOA = 80%, Kappa = 60%).

Independent Variable

1. Independent variable is described with replicable precision.
2. IV is systematically manipulated and under the control of the experimenter.
3. Overt measurement of the fidelity of implementation for the independent variable is highly desirable.

Baseline

1. The majority of single-subject research studies will include a baseline phase that provides repeated measurement of a dependent variable and establishes a pattern of responding that can be used to predict the pattern of future performance, if introduction or manipulation of the independent variable did not occur.
2. Baseline conditions are described with replicable precision.

Experimental Control/Internal Validity

1. The design provides at least three demonstrations of experimental effect at three different points in time.
2. The design controls for common threats to internal validity (e.g., permits elimination of rival hypothesis)
3. The results document a pattern that demonstrates experimental control.

External Validity

1. Experimental effects are replicated across participants, settings, or materials to establish external validity.

Social Validity

1. The dependent variable is socially important.
2. The magnitude of change in the DV resulting from the intervention is socially important
3. Implementation of the IV is practical and cost-effective.
4. Social validity is enhanced by implementation of the IV over extended time periods, by typical intervention agents, in typical physical and social contexts.

Quantity of research

Determining evidence-based practices relies on the accumulation of results over time and over different research conditions (e.g., geographic regions, research teams, settings). The accumulation of results that converge toward a generalization of effectiveness provides more confidence than the results of a single study – even if that single study is approached with the highest of rigor and results in a large effect size.

Multiple high quality, experimental studies are needed to conclude that a practice is evidence-based. For example, in special education, Gersten et al. (2005) recommended that at least 4 acceptable quality studies or 2 high quality group experimental studies support an evidence-based practice while Horner et al. (2005) recommended that 5 high quality single-subject research studies support an evidence-based practice. Horner et al.'s recommendation further qualified that to be considered evidence-based on the basis of single-subject research, the practice's minimum of five high quality single-subject studies must (a) be conducted by at least three different researchers in at least three different locations and (b) includes a total of at least 20 participants.

Other disability service fields have also developed and implemented criterion-based frameworks for determining effective or evidence-based practices. For example, the Division 12 Task Force of the American Psychological Association (APA) recommended that for a treatment to be considered well-established, at least one of two empirical criteria must be met (Chambless et al., 1998):

1. Two or more good group design experiments must demonstrate that the treatment is either (a) significantly superior to pill, placebo, or other treatment, or (b) equivalent to a previously established treatment.

2. More than nine single-subject studies demonstrating experimental design and favorably comparing the intervention to another treatment.

Applied research cannot provide absolute proof that an intervention is effective. Instead, the findings of an experimental study can either add support to or weaken the hypothesis that a practice causes meaningful changes in individual outcomes. The more high-quality experimental studies that support a practice, the greater the confidence we have that it causes desired changes. And the more high quality experimental studies that provide consistent findings regarding effectiveness, the greater confidence we have in determining the practice to be evidence-based.

What does being an evidence-based practice mean?

The essential steps in determining whether a practice is evidence-based seem to be (a) locating the high quality, experimental research that examines the effectiveness of the practice and then (b) determining whether sufficient quantity of evidence showing that the practice causes improved outcomes exists.

Being evidence-based does not mean that a practice is guaranteed to work for every individual in every situation (Cook, Smith, & Tankersley, 2011). For example, the findings from a group experimental study might demonstrate that individuals who received an intervention achieved superior outcomes *on average* in comparison to similar individuals in the control group who did not receive the intervention. That does not mean that *every* individual in the experimental group excelled following the implementation of the practice. However, despite this caution, when implemented as designed, we can be confident that evidence-based practices provide the highest likelihood of improving outcomes. To use a gambling analogy, implementing an evidence-based practice is similar to placing a bet that is, say, 95% likely to pay off; whereas, implementing a practice shown by research not to be evidence-based may have, for example, only a 50% chance of paying off. Even though a pay off is not guaranteed

with either strategy, it is clear which is the best bet in the high stakes game of disability services (Cook, Tankersley, Cook, & Landrum, 2008). Accordingly, evidence-based practices should be the first option for practitioners who want to improve outcomes of individuals with disabilities.

Conclusion

Practitioners make the ultimate determination regarding the interventions that individuals with disabilities receive. It is imperative that we use the most effective practices, and that the fields of disability services identify what those practices are so that practitioners can have the greatest impact. As Hammersley (2005) asked, "Who would want…practice not to be based on evidence?" (p.86). The fields of disability services are beginning to identify and stress the implementation of evidence-based practices. Although much important work lies ahead for disability service researchers and practitioners, we will approach these tasks with an optimistic enthusiasm for it is evidence-based practices that provide our students, clients, friends, and family members the best chance of success.

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