Evidence Based Practices in Autism Spectrum Disorders (ASD): What Teachers Know and Do

Sarah Howard-Willms
Great Circle

Peppy Howard-Willms
Great Circle
Overview

- Over the past 4 years, we have been studying evidence based practices (EPBs) in school systems.
  - How do teachers define evidence based practice?
  - How do teachers identify EBPs?
  - How do teachers select EBPs for intervention?
  - How frequently do teachers use these practices?
  - How effective do teachers find these practices?

- Previous studies have examined evidence based practices for
  - students with emotional & behavioral disorders, as well as in
  - schools with school-wide positive behavior support systems.

- In this study, we report on teacher use and training in specific practices identified as evidence based for students with Autism Spectrum Disorder
"Evidence-based medicine is the integration of best research evidence with clinical expertise and patient values."

Discussion in the field of education as to whether the definition of evidence based practice should be broad or narrow in focus

For example, Whitehurst (2002) defines EBP as:

“The integration of professional wisdom with the best available empirical evidence in making decisions about how to deliver instruction.”
The term “evidence-based practice” (EBP) refers to a body of scientific knowledge, defined usually by reference to research methods or designs, about a range of service practices (e.g., referral, assessment, case management, therapies, or support services). The knowledge base is usually generated through application of particular inclusions criteria (e.g., type of design, types of outcome assessments) and it generally describes the impact of particular service practices on child, adolescent, or family outcomes. “Evidence-based practice” or EBP is a shorthand term denoting the quality, robustness, or validity of scientific evidence as it is brought to bear on these issues. (p. 5)
Evidence based practices are informed by research, in which the consequences of environmental variables are empirically established and the relationship directly informs what a practitioner can do to produce the desired outcomes. (Dunst, Trivett, & Cutspec, 2002)
State Department of Elementary & Secondary Education

Evidence based Education

Professional Wisdom

Empirical Evidence

Individual Experience

Consensus

Scientifically-Based Research

Empirical Information
A decision making process that integrates
- best available evidence
- professional judgment
- client values and context

Practice refers to *all* professional activities of an educator
Different emphasis in educators definition

- Notice that earlier versions promoted by educators focus on
  - Professional wisdom
  - Empirical evidence, scientific research

- What’s missing in earlier definitions??
  - Student/family values
  - Context

- We shall return to this later
What teachers know about EBP

- Campbell & Kelk (2011) surveyed 248 teachers in mid-west U.S.A school districts

- Part of a study on teacher knowledge of evidence-based practices and Positive Behavior Supports & Interventions (PBIS)

- Survey questions on definition of Evidence-based Practice, and how individual teachers and team engage in decision-making
“What is your team’s definition of evidence-based practice? Select all that apply.”

- Intervention effectiveness is demonstrated using valid scientific research methods.
- Intervention research is published in a peer-reviewed, professional source.
- Positive research findings or reports are replicated in at least three well-designed, controlled studies.
- Intervention methods and procedures are clearly described so as to easily duplicate and implement with fidelity.
- Intervention outcomes are observable and measurable.
“My Definition Includes:” (from Campbell, 2011)
Total Number of Criteria Selected Individually or as Team Member (from Campbell, 2011)
When deciding whether an intervention is evidence-based, how important is the criterion? Critical (from Campbell, 2011)
Where do teams find research on Evidence-Based Interventions? (from Campbell, 2011)
Research Synthesis approaches to Evidence Based Practices

- Two large studies synthesized current research on evidence based practices in Autism
- 2008 National Professional Development Center
- 2009 NAC published National Standards Project
In 2008 the NPDC conducted an extensive review of the autism intervention literature published between 1997 and 2007 and identified 24 practices that meet criteria for evidence-based practices for children and youth with autism spectrum disorders.
Randomized or quasi-experimental design studies: Two high quality experimental or quasi-experimental group design studies,

Single-subject design studies: Three different investigators or research groups must have conducted five high quality single subject design studies, or

combination of evidence. One high quality randomized or quasi-experimental group design study and three high quality single subject design studies conducted by at least three different investigators or research groups (across the group and single subject design studies).

NPDC
How was Evidenced Based determined?
Through the use of the SMRS (scientific merit rating scale) +

Treatment Effects Rating =

NSP
How was Evidence Based determined?

Strength of Evidence Classification System
Five Critical Areas of SMRS

1. Research Design
2. Measure of Dependent Variable
3. Measure of Independent Variable
4. Participant ascertainment
5. Generalization
Treatment Effects Rating

1. Beneficial
2. Ineffective
3. Adverse
4. Unknown
### Strength of Evidence Classification System

<table>
<thead>
<tr>
<th>Established</th>
<th>Emerging</th>
<th>Unestablished</th>
<th>Ineffective</th>
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<tbody>
<tr>
<td>Several Studies</td>
<td>Few published studies</td>
<td>May or May not be based on research</td>
<td>Several Studies</td>
</tr>
<tr>
<td>SMRS: 3,4,5</td>
<td>SMRS: 2</td>
<td>SMRS: 0,1</td>
<td>SMRS: 3</td>
</tr>
<tr>
<td>TE: Beneficial</td>
<td>TE: Beneficial</td>
<td>TE: Ineffective or unknown</td>
<td>TE: Ineffective or Harmful</td>
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</table>
In 2007, the NSP identified 11 categories of evidenced based treatments with thirty-eight evidenced based interventions identified.

NCPD identified 24 evidence based practices
<table>
<thead>
<tr>
<th>Evidence-Based Practices Identified by the National Professional Development Center (NPDC) on ASD</th>
<th>Established Treatments Identified by the National Standards Project (NSP)</th>
<th>Comprehensive Behavioral Treatment for Young Children</th>
<th>Joint Attention Intervention</th>
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</thead>
<tbody>
<tr>
<td>Prompting</td>
<td>X</td>
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<tr>
<td>Antecedent-Based Intervention</td>
<td>X</td>
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<td>Time delay</td>
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<td></td>
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<tr>
<td>Reinforcement</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Task analysis</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Discrete Trial Training</td>
<td>X</td>
<td></td>
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<tr>
<td>Functional Behavior Analysis</td>
<td>X</td>
<td></td>
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<tr>
<td>Functional Communication Training</td>
<td>X</td>
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<tr>
<td>Response Interruption/Redirection</td>
<td>X</td>
<td></td>
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<tr>
<td>Differential Reinforcement</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Social Narratives</td>
<td>X</td>
<td></td>
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<tr>
<td>Video Modeling</td>
<td>X</td>
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<tr>
<td>Naturalistic Interventions</td>
<td>X</td>
<td></td>
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<tr>
<td>Peer Mediated Intervention</td>
<td>X</td>
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<tr>
<td>Pivotal Response Training</td>
<td>X</td>
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<tr>
<td>Visual Supports</td>
<td>X</td>
<td></td>
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<tr>
<td>Structured Work Systems</td>
<td>X</td>
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<tr>
<td>Self-Management</td>
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Parent Implemented Intervention

The NPDC on ASD did not review comprehensive treatment models. Components of The Comprehensive Behavioral Treatment of Young Children overlap with many NPDC-identified practices.

The NSP did not consider parent-implemented intervention as a category of evidence-based practice. However, 24 of the studies reviewed by the NSP under other intervention categories involve parents implementing the intervention.

Social Skills Training Groups

Social Skills Training Groups (Social Skills Package) was identified as an emerging practice by the NSP.

Speech Generating Devices

Speech Generating Devices (Augmentative and Alternative Communication Device) was identified as an emerging practice by the NSP.

Computer Aided Instruction

Computer Aided Instruction (Technology-based Treatment) was identified as an emerging practice by the NSP.

Picture Exchange Communication

Picture Exchange Communication System was identified as an emerging practice by the NSP.

Extinction

Extinction (Reductive Package) was identified as an emerging practice by the NSP.
Administered via Survey Monkey

Distributed to SPED teachers of students with autism

Teachers employed by four (4) organizations located in the mid-west of U.S.A

202 teachers of students with Autism responded
Evidence-Based Practices Surveyed

- Positive Reinforcement Use
- Visual Supports Use
- Social Stories Use
- Task Analysis Use
- Differential Reinforcement Use
- Self Management Use
- Token Economy Use
- Functional Communication Use
- Video Modeling Use
- Naturalistic Teaching Use
- Discrete Trial Use
- Pivotal Response Use
Campbell and Howard-Willms (2013)

EXPERIENCE OF RESPONDENTS

- Less Than 5 Years
- 5 - 10 Years
- Greater Than 10 Years
Percentage of Teachers Using Selected Procedures

- Positive Reinforcement Use: 99.0% yes, 1.0% no
- Visual Supports Use: 94.1% yes, 5.9% no
- Social Stories Use: 74.9% yes, 25.1% no
- Task Analysis Use: 68.0% yes, 32.0% no
- Differential Reinforcement Use: 67.0% yes, 33.0% no
- Self Management Use: 61.9% yes, 38.1% no
- Token Economy Use: 57.9% yes, 42.1% no
- Functional Comm Use: 34.4% yes, 65.6% no
- Video Modeling Use: 33.3% yes, 66.7% no
- Naturalistic Teaching Use: 28.7% yes, 71.3% no
- Discrete Trial Use: 25.9% yes, 74.1% no
- Pivotal Response Use: 12.3% yes, 87.7% no
Percentage of Teachers Reporting Training on Specific Procedures

- Positive Reinforcement Training: 76.7% YES, 23.3% NO
- Visual Supports Training: 70.6% YES, 29.4% NO
- Discrete Trial Training: 70.6% YES, 29.4% NO
- Functional Comm Training: 69.2% YES, 30.8% NO
- Token Economy Training: 69.1% YES, 30.9% NO
- Task Analysis Training: 58.3% YES, 41.7% NO
- Differential Reinforcement Training: 57.1% YES, 42.9% NO
- Social Stories Training: 54.4% YES, 45.6% NO
- Naturalistic Teaching Training: 46.3% YES, 53.7% NO
- Self Management Training: 43.6% YES, 56.4% NO
- Video Modeling Training: 36.9% YES, 63.1% NO
- Pivotal Response Training: 33.3% YES, 66.7% NO
Use vs. Training
Percentage of Teachers Using a Specific Procedure Trained for that Procedure
Comparison of Use Dependent Upon Experience
Comparison of Training Dependent Upon Experience
Interesting Points

- Teachers with less than 5 years of experience are more likely across the board to use EBPs identified by NSP and NCPD. For each practice, a higher % of less experienced teachers reported using the practice.

- The percentage of teachers in the sample that had received training on the identified EBPs ranged from 33% for the least frequently used practice (pivotal response) to 76% for the most frequently used practice (positive reinforcement).
Questions

- Does usage data reflect training issues? Those practices which are less frequently used are for the most part the less frequently trained.
- Does usage data reflect ease of implementation? Are practices which are easier to implement, or do not require substantial resources, more likely to be used? Fit the resources of the classroom and school? How much support is provided to teacher? Does the teacher need aides?
- Does the data reflect name recognition of the practice?
Does usage data reflect contextual variables?

- Does the intervention fit the culture of the classroom?
- Does usage data reflect cultural and value factors of teachers and families?
- Does the practice require adaptations?
- Should the intervention be adapted to the culture, philosophy, needs of student and families?
Conclusions and Further Inquiry

- Areas of concern for more training
- How much training are teachers getting, what type of training, and to what extent
- How training takes place and how is it practiced
- Differences among schools, universities, countries/demographics
Conclusions and Further Inquiry

- Fidelity
- Teachers’ comfort levels
- Gaps between training and implementation
- Protocol for treatments vs. practice in classrooms
- Contextual differences – Restrictions