Applying the RE-AIM Framework to Guide Rehabilitation Research

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Evidence Based Practice (EBP) in Rehabilitation

- EBP has assumed a central role in health and behavioral research

- EBP involves using the best available evidence

- Evidence Grading
<table>
<thead>
<tr>
<th>Levels of Evidence</th>
<th>Description</th>
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<tbody>
<tr>
<td>Level 1</td>
<td>Strong evidence from at least one systematic review of multiple well-designed randomized controlled trials</td>
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<tr>
<td>Level 2</td>
<td>Strong evidence from at least one properly designed randomized controlled trials of appropriate size</td>
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<tr>
<td>Level 3</td>
<td>Evidence from well-designed trials without randomization, single group pre-post, cohort, time series, or matched case controlled studies</td>
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<tr>
<td>Level 4</td>
<td>Evidence from well-designed non-experimental studies from more than one center or research group</td>
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<tr>
<td>Level 5</td>
<td>Evidence from opinions of respected authorities, based on clinical evidence, descriptive studies, or reports of expert committees</td>
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Challenges with EBP in Rehabilitation

- Multiple challenges that impact EBP and Rehabilitation:
  - *Lack of Level 1 studies (RCT),*
  - *Scope and nature of the field,*
  - *Multidisciplinary, multiple outcomes (i.e. employment, independent living)*

- Specific challenges include but are not limited to...
  - *Breadth and complexity*
  - *Emphasis on empowerment (participatory action research)*
  - *Small sample sizes*
  - *Blinding and placebo effects*
  - *Lack of funding (i.e. pilot studies, intervention development)*
Internal vs. External Validity

- Key issue in rehabilitation research is to balance *internal* and *external* validity.

- *Studies that produce high internal validity may lead to lower levels of external validity.*

- *Efficacy*: Internal validity should be maximized.

- *Relevance, Dissemination, and Adoption*: External validity should be maximized.
Ultimate goal of rehabilitation research is to gain sufficient knowledge about an intervention to answer the key question asked by Paul (1969)-

“What treatment, for what population, delivered by whom, under what conditions, for what outcome, is most effective, and how did it come about?”
Assessing Intervention Impact

- Understand conditions for which and whom it works
- Immediate and long-term effects
- Individual and Setting Level
- Mediating/Moderating Variables
<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
<th>Rehabilitation Example</th>
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<tbody>
<tr>
<td>Phase 1</td>
<td>Hypothesis Development</td>
<td>Identification of the link in existing research and literature between poor employment outcomes for individuals with psychiatric disabilities and traditional vocational rehabilitation job placement models</td>
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<td>Phase 2</td>
<td>Methods Development</td>
<td>Development and pilot testing of supported employment interventions to increase employment outcomes for individuals with psychiatric disabilities</td>
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<tr>
<td>Phase 3*</td>
<td>Controlled Intervention Trials (Efficacy Studies)</td>
<td>Small scale randomized trial of supported employment interventions for individuals with psychiatric disabilities</td>
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<tr>
<td>Phase 4*</td>
<td>Defined Population Studies (Effectiveness)</td>
<td>Larger-scale trials of supported employment interventions when applied to all individuals with psychiatric disabilities in a community based treatment facility</td>
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<tr>
<td>Phase 5*</td>
<td>Demonstration (Dissemination)</td>
<td>Evaluation of results when supported employment program is provided to all individuals with psychiatric disabilities receiving services in a given state</td>
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RE-AIM Evaluation Framework

- Initial Conceptualization
  - Impact = Reach x Efficacy

- RE-AIM extends this approach
  - Impact a function of:
    - Reach
    - Efficacy
    - Adoption
    - Implementation
    - Maintenance
RE-AIM Dimensions and Questions in Evaluating Rehabilitation Interventions and Programs

<table>
<thead>
<tr>
<th>RE-AIM Dimension</th>
<th>Questions</th>
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<tr>
<td>Reach (Individual Level)</td>
<td>What percentage of potentially eligible participants will take part and how representative are they?</td>
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<tr>
<td>Efficacy (Individual Level)</td>
<td>What impact did the intervention have on all participants who began the program, on intermediate and primary outcomes, and on both positive and negative (unintended) outcomes including quality of life</td>
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<tr>
<td>Adoption (Setting Level)</td>
<td>What percentage of settings and intervention agents (VR Offices, CBRP Offices, CIL Centers) will participate and how representative are they?</td>
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<tr>
<td>Implementation (Setting or Agent Level)</td>
<td>To what extent are the various intervention components delivered as intended (in the protocol), especially when conducted by regular (non-research) staff in applied settings</td>
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| Maintenance (Both Individual and Setting Level) | **Individual Level** - What are the long-term effects (minimum in six to 12 months following interventions)?  
 **Setting Level** - To what extent are different intervention components continued or institutionalized? |
Relationships Among Dimensions

- RE-AIM Framework provides a method to analyze the impact of a specific intervention by examining both the internal and external validity.

- RE-AIM Framework can be used to guide research program development, determine areas of strengths and weakness

- Guide research funding

- Assist in grant and project development (Longitudinal)
RE-AIM Example with Supported Employment

- Basic Research Question
  - Extent to which supported employment intervention research conducted in community rehabilitation settings addresses the various RE-AIM dimensions?
  - Randomly selected studies from 1995-Present
Results – Reach

All studies (100%) reported on the percentage of eligible participants who participated in the study studies

(100%) reported on the representativeness of sample based on demographic or medical status variables

(67%) studies reported on the potential participants who were excluded by investigators.
Results - Efficacy

(100%) reported the vocational outcomes of participants.

33% of studies reported on quality of life
Results- Adoption

8% reported on the percentage of sites approached who agreed to participate.

8% reported the representativeness of intervention sites.

No studies reported the percentage and representativeness of the intervention agents.

No studies reported the percentage of possible settings that were excluded by the investigators.
Results - Implementation

100% reported the methods of intervention delivery and the significant majority reported consistent delivery of the protocol (Fidelity)

25% reported on the resources required to deliver the intervention, with a majority of studies reporting the intervention protocol duration
Results - Maintenance

92% reported on individual-level outcomes at least 6 months follow-up.

67% of studies reported attrition rates at follow-up.

67% of studies reported on some analytic procedure to evaluate the potential impact of attrition on outcomes.

At the setting level

- No studies reported on the extent to which the intervention was continued after the study period had concluded.
Discussion

– High degrees of R,E,I and M (Individual)

– Lacking research in A & M (Setting)

– Findings are consistent with research in health area that reveals a lack of research in the AIM areas

– Good results in Implementation- a strength when compared other health areas.
Directions for Rehabilitation Research

• Expand research beyond examining *efficacy* to examine the factors that impact - *A, I, M*

• Challenge the conceptualization that the most efficacious is not always the best

• Contextual factors are critical and must be examined
Questions