A Systematic Review of Multifaceted Interventions for Improved Community Participation

October 29, 2018
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This systematic review was conducted with funding from two grants from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR grant numbers 90RT5043 and 90DP0027). NIDILRR is a Center within the Administration for Community Living (ACL), Department of Health and Human Services (HHS). The contents of this systematic review do not necessarily represent the policy of NIDILRR, ACL, HHS, and you should not assume endorsement by the Federal Government.
Agenda

1. Why conduct a systematic review or meta-analysis?
2. How did partnerships support this research?
3. What did we do?
4. How did we do it?
5. What did we learn?
6. What are the implications?
7. Q & A
Why conduct a systematic review or meta-analysis?
Systematic Review

• Is a formal, systematic and structured approach to reviewing all relevant and best available literature on a specific topic/outcome of interest
  – Transparent procedures defined in advance
  – Replicable
  – Minimize bias

• Provides an overview of the current state of the research

• May be qualitative or quantitative
Systematic Review

• Studies included in a review are screened for quality, so that the findings of a large number of studies can be combined.

• Peer review is a key part of the process

_from the Campbell Collaboration: What is a systematic review?_
https://campbellcollaboration.org/research-resources/writing-a-campbell-systematic-review/systemic-review.html
A Systematic Review Must Have:

• Clear inclusionary/exclusionary criteria
• An explicit search strategy
• Systematic coding and analysis of included studies
• Meta-analysis (where possible)

*From the Campbell Collaboration: What is a systematic review?*
https://campbellcollaboration.org/research-resources/writing-a-campbell-systematic-review/systemic-review.html
Meta-analysis

- Statistical analysis of the impact of the outcome of interest
- By combining the samples of the individual studies, the overall sample size is increased, thereby improving the statistical power of the analysis as well as the precision of the estimates of treatment effects.
How did partnerships support this research?
Key Partners

• University of Kansas
  – Research & Training Center on Promoting Interventions for Community Living researchers
  – University librarian
  – Research assistant
  – Funding support
Key Partners

American Institutes for Research, Center on Knowledge Translation for Disability and Rehabilitation Research (KTDRR)

Offers in-kind support to NIDILRR grantees doing systematic review/research syntheses

In this case:
- Statistical consultant
- Research assistant
- Technical support
What did we do?
Two Studies in this Systematic Review

• Meta-analysis
  – Determined effectiveness of multi-faceted interventions
  – Analyzed 15 quantitative articles

• Qualitative Analysis
  – Determined common components and characteristics of multi-faceted interventions
  – Analyzed 20 articles - quantitative (17) and qualitative (3)
How did we do it?
Defining the Outcome

• Worked with RTC/PICL Scientific-Consumer Advisory Panel to clearly define target for review
• Defined key terms: disability, multifaceted, community participation outcomes, community-based settings
• Determined inclusionary and exclusionary criteria
Defining the Participants

• 18 years of age or older
• With one or more disabilities
• Who exited the secondary education/high school setting and services
Conducting the Search

• University of Kansas librarian and researcher collaboration
• Determined appropriate databases for the search – reviewed 17 - selected 3 for peer-reviewed (1 health related, 1 citation index, 1 subject-specific) and 2 for grey literature
• Used different controlled vocabulary and search mechanisms as appropriate for each database
• Used limiters to help manage quantity of results, minimize duplicative results, and focus on target population
Reviewing the Articles

• At least two researchers reviewed articles at each stage
  – Abstract and title (4,742)
  – Full-text review for initial criteria (186)
  – Full-text methodological quality review (37)

• Our search located 15 eligible studies measuring outcomes related to community participation
Conducting the Analyses

• Used Comprehensive Meta-Analysis Software (CMA)
• A total of 74 effect sizes were calculated across the 15 studies
• An aggregate analysis was conducted.
• An analysis of outcomes at the study level was conducted with positive treatment effects found for the outcomes of employment, mental health, adult education, and quality of life.
• Two other studies had met criteria for study inclusion but not the criteria for data analysis.
What did we learn?
Participants

• Most had a disability that makes executive functioning a challenge
  – Traumatic Brain Injury (2)
  – Mental Health (7)
  – Aging (4)
  – Developmental Disability (1)
  – Not reported (1)

• Many multifaceted interventions had a cognitive coaching component

• Countries represented:
  – U.S. (10), Italy (1), China (1), Australia (1), and Germany (2)
Study Characteristics

• 15 studies published 2000-2014
• 74 effect sizes computed (mean=5, range 1 to 22)
• Length of treatment (mean=27 weeks, range=4 to 105 weeks)
## Aggregated Study Effects

Combined outcomes for each included study.

<table>
<thead>
<tr>
<th>Study</th>
<th>Hedges' g</th>
<th>Lower Limit</th>
<th>Upper Limit</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Cook, 2005</td>
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<td>0.004</td>
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<td>McGurk, 2007</td>
<td>0.917</td>
<td>0.303</td>
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<td>Onor, 2007</td>
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<td>0.141</td>
<td>0.095</td>
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<td>Guttman, 2009</td>
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<td>0.467</td>
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<td>Kurz, 2009</td>
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<td>0.009</td>
<td>1.031</td>
<td>0.018</td>
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<tr>
<td>Tsang, 2009</td>
<td>0.854</td>
<td>0.459</td>
<td>1.248</td>
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<td>Szanton, 2011</td>
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<td>-0.567</td>
<td>0.706</td>
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<tr>
<td>Ferguson, 2012</td>
<td>0.798</td>
<td>-0.046</td>
<td>1.642</td>
<td>0.064</td>
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<tr>
<td>Twamley, 2014</td>
<td>0.345</td>
<td>-0.319</td>
<td>1.009</td>
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<tr>
<td><strong>Overall Effect</strong></td>
<td>0.280</td>
<td>0.067</td>
<td>0.493</td>
<td>0.010</td>
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</tbody>
</table>
Potential Independent Variables

• Design Characteristics
  – Type of Design
  – Type of Analysis

• Treatment Characteristics
  – Length of Treatment

• Outcome Characteristics
  – Employment (n=5)
  – ADL (n=3)
  – Mental Health (n=2)
  – Education/Learning Training (n=1)
  – Quality of Life (n=2)
  – Autonomy (n=1)
  – Independent Living, Social Skills, Community Participation (n=1)
### Results for Employment

<table>
<thead>
<tr>
<th>Study</th>
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<tr>
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<td>0.3</td>
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<td>0.003</td>
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<tr>
<td>Bell, 2008</td>
<td>0.109</td>
<td>-0.35</td>
<td>0.568</td>
<td>0.639</td>
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<td>Tsang, 2009</td>
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<td>0.5</td>
<td>1.248</td>
<td>0.001</td>
</tr>
<tr>
<td>Gimm, 2011</td>
<td>-0.121</td>
<td>-0.2</td>
<td>-0.042</td>
<td>0.003</td>
</tr>
<tr>
<td><strong>Overall Effect</strong></td>
<td><strong>0.444</strong></td>
<td><strong>-0.06</strong></td>
<td><strong>0.949</strong></td>
<td><strong>0.085</strong></td>
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## Results for Employment

### Employment Outcome Associated with Method of Analysis

<table>
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<th>Method of Analysis</th>
<th>Study</th>
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<tr>
<td>ITT</td>
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<td>0.109</td>
<td>-0.349</td>
<td>0.568</td>
<td>0.639</td>
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<td>ITT</td>
<td>Gimm, 2011</td>
<td>-0.121</td>
<td>-0.200</td>
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<td>0.003</td>
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<tr>
<td></td>
<td><strong>Combined ITT</strong></td>
<td><strong>-0.115</strong></td>
<td><strong>-0.192</strong></td>
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<td><strong>0.004</strong></td>
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<td>TOT</td>
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<tr>
<td></td>
<td><strong>Combined TOT</strong></td>
<td><strong>0.786</strong></td>
<td><strong>0.516</strong></td>
<td><strong>1.056</strong></td>
<td><strong>0.001</strong></td>
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</table>
## Results for Employment

<table>
<thead>
<tr>
<th>Length of Treatment</th>
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<tr>
<td>1-10 weeks</td>
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<td>0.018</td>
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<td>0.303</td>
<td>1.531</td>
<td>0.003</td>
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<tr>
<td></td>
<td><strong>Combined 1-10 weeks</strong></td>
<td>0.694</td>
<td>0.322</td>
<td>1.065</td>
<td>0.001</td>
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<tr>
<td>20+ weeks</td>
<td>Bell, 2008</td>
<td>0.109</td>
<td>-0.349</td>
<td>0.568</td>
<td>0.639</td>
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<td>20+ weeks</td>
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<td>-0.2</td>
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<td>0.003</td>
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<tr>
<td></td>
<td><strong>Combined 20+ weeks</strong></td>
<td>0.277</td>
<td>-0.355</td>
<td>0.909</td>
<td>0.390</td>
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<tr>
<td>Flemming, 2009</td>
<td>-0.699</td>
<td>-1.36</td>
<td>-0.04</td>
<td>0.038</td>
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<tr>
<td>Overall Effect</td>
<td>0.059</td>
<td>-0.59</td>
<td>0.704</td>
<td>0.857</td>
</tr>
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</table>
Results for Employment

• Follow up assessment was conducted for 2 studies using different post treatment measurement times – one study had significant effects while the other was non-significant.
Results for Quality of Life

• 2 studies reported QoL outcomes
  – 1 RCT Exp vs Ctl yielded a significant treatment effect in aging participants (g= 0.693, p=0.003)
  – 1 QED Exp vs Comp yielded a non-significant treatment effect for TBI participants (g= 0.195, p=0.561)
Results for Mental Health

• 2 RCT Exp vs Ctl studies assessed mental health outcomes in aging participants (g = -0.738, p=0.026) suggesting the control group performed better than the treated group
Results for Adult Education

• 1 QED comparison study assessed adult learning for social skills and tasks and interpersonal skill development outcomes in psychiatric disabled group – yielding a significant group difference (g=1.144, p. <0.001).
Non-significant Outcomes

- Activities of Daily Living (ADLs/IADLs)
- Autonomy
- Independent Living
- Social Skills
- Community Activities
What are the implications?
Research

• Limited support for effectiveness of multifaceted interventions suggests need for more research to determine effectiveness broadly as well as specifically in relation to community participation of adults with disabilities.

• A narrowed focus on outcomes for targeted groups of adults with similar disabilities may yield greater insight into the potential effectiveness of multifaceted interventions.
Practice

• Consider focusing practice on use of multifaceted interventions with focused outcomes (e.g., employment) and targeted populations (e.g., TBI, mental health, aging)
Questions and Comments?

Thanks!
Evaluation

Please complete this brief evaluation:
The contents of this presentation were developed under grant number 90DPKT0001 from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR). NIDILRR is a Center within the Administration for Community Living (ACL), Department of Health and Human Services (HHS). The contents of this presentation do not necessarily represent the policy of NIDILRR, ACL, HHS, and you should not assume endorsement by the Federal Government.