Expanded Interventions, Methods, and Metrics for Translational Research using the RE-AIM Framework

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An example of translation

• Active Choices & Active Living Every Day

• First RCT published in 1991—consistent efficacy in increasing regular physical activity

• One was small group based one telephone based
How does the pipeline work?

- RWJF-Active for Life® (AFL)
- Competitive grants for community organizations to deliver either Active Choices or ALED awarded in 2001
- Goals:
  - Reach diverse populations
  - Test the effectiveness
  - If effective to translate Active Choices and ALED into sustained delivery across the grantee communities beyond the life of the grant

How does the pipeline work?

- Reached a diverse population
- Similar effect sizes relative to physical activity increases
- With a high level of resources, ongoing training and support for 5 years, and a highly motivated set of community organizations....
- only 7 of 12 Sites were confident they would to maintain the program post grant funding
- The pipeline has lots of holes!
Readiness for translation?

- Internal validity perspective:
  - The *magnitude of effect* as the key indicator of readiness for translation and adheres to the principles of *evidence rating* for determining efficacy.

- External validity perspective:
  - Attention to intervention features that can be *adopted* and delivered broadly, have the ability for *sustained* and consistent *implementation* at a reasonable cost, *reach* large numbers of people, especially those who can most benefit, and produce *replicable* and *long-lasting effects*.

RE-AIM Outcomes

- **Reach**: The number, percent of target audience, and representativeness of those who participate
- **Effectiveness**: Change in outcomes and impact on quality of life and any adverse outcomes
- **Adoption**: Number, percent and representativeness of settings and educators who participate
- **Implementation**: Extent to which a program or policy is delivered consistently, and the time and costs of the program
- **Maintenance**: Sustained change in outcomes and impact on quality of life and any adverse outcomes
- **Maintenance**: Extent of discontinuation, modification, or sustainability of intervention
Reach, Effectiveness, Maintenance

Key Translational Issues:

• Shift from focus on the numerator to the denominator
• Generalizability to target population
• Avoid contributing to disparities
• Common comparison for decision making including unintended consequences
• Robustness when combined with adoption: what works best for whom, and under what conditions
Adoption, Implementation, Maintenance

Translational Issues:

- Will the intervention fit in a typical practice setting?
- Generalizability to delivery agents
- Initial start-up and ongoing costs
- Understanding structure and who makes adoption decisions (and how they are made)
- Characteristics of the intervention, setting, culture, and organization that facilitate or impede implementation
A RE-AIM Effectiveness Trial

- Pragmatic cluster RCT of worksite weight loss programs (n=28 worksites)

- IncentaHealth
  - Internet delivered (daily emails)
  - Environmental change (year round health spot; signage)
  - Modest monetary incentive, to increase reach

- Livin’ My Weigh
  - Internet delivered (quarterly newsletters via email)
  - Environmental changes (intermittent health spot; signage)
  - No monetary incentives.
Targeted RE-AIM Dimensions

• All dimensions are considered in the design, but some are intervention targets while others are only assessed and described.

• Intervene or describe…
  – Reach
  – Effectiveness
  – Adoption
  – Implementation
  – Maintenance
  – Maintenance

Temporally

• Adoption
• Reach
• Implementation
• Effectiveness
• Maintenance
Adoption

- **Exclusion criteria**
  - <150 employees & >600 employees
  - Non-contiguous buildings
  - Would not allow a brief health survey

- **Professional groups and small colleges** were, on average, about 10 percent less likely to adopt (p’s>.05)

- **Anything missing?**

**Total Worksites**
N=119

**Eligible**
N=73
- 17 – Governmental Agencies
- 16 – Professional groups
- 14 – Small colleges
- 13 – Manufacturing
- 9 – Medical Facilities
- 4 – Call Centers

**Ineligible**
N=46
- 19 – Too few employees
- 11 – No Internet
- 10 – Multiple locations
- 6 – Too many employees

**Enrolled**
N=39 (53.4%)
- 10 – Governmental Agencies
- 10 – Manufacturing
- 6 – Small colleges
- 5 – Professional groups
- 5 – Medical Facilities
- 2 – Call Centers

- **INCENT**
  N=14
  - 4 – Governmental Agencies
  - 2 – Manufacturing
  - 3 – Professional groups
  - 1 – Small colleges
  - 2 – Medical Facilities
  - 2 – Call Centers

- **Livin’ My Weigh**
  N=14
  - 3 – Governmental Agencies
  - 4 – Manufacturing
  - 2 – Professional groups
  - 3 – Small colleges
  - 2 – Medical Facilities
  - 0 – Call Centers

**Randomized**
N=28 (38.3%)

**Dropped**
N=11
No continued support from management and interest from employees

- **6-Month Retention**
  N=14 (100%)

**Enrolled**
N=39 (53.4%)

- **6-Month Retention**
  N=13 (93%)

**Enrolled**
N=39 (53.4%)

- **12-Month Retention**
  N=13 (93%)

**Enrolled**
N=39 (53.4%)

- **12-Month Retention**
  N=13 (93%)

**Dropped**
N=1
Company Closed

**Dropped**
N=1
No management support
Reach

- Brief health survey to ~70% or greater of entire worksite population (before weight loss program announced)
- Exclusion criteria-BMI under 25; inability to read English (n=6204 eligible; n=1780 participated)
- IncentaHealth participants were more representative on race than Livin’ My Weigh

What is missing?
Implementation

• 90% of all content was delivered as intended and on time
• 10% of content was not delivered due to technical difficulties or worksite withdrawal
• No adaptations were made to IncentaHealth over the course of the study.
• Livin’ My Weigh was adapted to include 4 in-person, resource sessions—these were delivered as intended in 10/14 sites.
• Costs of delivery per site was approximately $3000 for incentaHealth and $500 for Livin’ My Weigh
• What is missing?
Effectiveness

• Changes in quality of life not significant
• No unintended injuries or other safety issues identified
• Some indication that initial weight status may moderate effect
• Overall attrition 26% at 12 months
• What is missing?
Maintenance

• Will add in table and info when analysis is done
Activity 1

• You are working with a consortium of local churches that is interested in reducing obesity
• They have identified two evidence-based programs
• The programs are described in your handout
• Which would you recommend they choose?
• How did you come to your decision?
• What information was most compelling?
• What other information did you want?
Combining RE-AIM indicators

• Simple way
  – Rate each dimension on 5 point scale from poor to outstanding
  – Sum the scores—highest-best

• Complex way
  – Develop summary numeric indicators based on proportions, effect sizes, robustness, and cost.
  – A priori weighting of dimensions
  – Combine indicators
A RE-AIM Implementation Trial

Participatory Dissemination Targeted Model

Efficacy to Effectiveness to Demonstration to Dissemination Model

Versus

Fit Extension

Active Living Everyday
N=56 Health Educators

Health Educators interested
N=36

64% Adoption at study level
No significant diffs between adopters and non adopters

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ALED
N=18

Fit Ex
N=18

Telephone Introduction

Online Training

In person training
Targeted RE-AIM Dimensions

- All dimensions are considered in the design, but some are intervention targets while others are only assessed and described.

- Intervene or describe...
  - Reach
  - Effectiveness
  - Adoption
  - Implementation
  - Maintenance$_i$
  - Maintenance$_o$

- Temporally
  - Adoption
  - Reach
  - Implementation
  - Effectiveness
  - Maintenance
Adoption

- Exclusion criteria
  - Delivery agents had to be employees of Virginia Cooperative Extension

- Adopters did not differ from non-adopters on age, ethnicity, or years of service.

- Anything missing?

\[ \chi^2(1) = 7.2, \ p < .01 \]
• Exclusion criteria—adults living in Virginia, with no contraindications for exercise

• Proportional reach is <0.1% (is this good?)

• Women more likely to participate and participants were slightly older than state population (44 vs 38).

• Fit Ex reached significantly more participants than ALED (60 vs 15/program)

• What is missing?
Implementation

• Fit Ex was adapted more often (60% delivered as intended) than ALED (100% delivered as intended).

• 10% of content was not delivered due to technical difficulties or worksite withdrawal.

• Costs of delivery were calculated to include training, planning, and delivery (i.e., recruitment, promotion, program tasks, supervision) time per participant engaged.
  – Fit Ex cost approximately 2.5 hours of delivery agent time per participant
  – ALED cost approximately 30 hours of delivery agent time per participant.

• What is missing?
Effectiveness & Maintenance

- Changes in quality of life not significant
- No unintended injuries or other safety issues identified
- Overall attrition 15% at program completion
- What is missing?
Maintenance

• ALED delivered in subsequent year

• Fit Ex maintained in initial form for 3 years post research

• Staff reduction in VCE nearly 40% since initial implementation, Fit Ex, now being developed as a service for local worksites partnering with cooperative extension.
Activity 2

• Briefly identify one research idea from your small group related to health promotion in community settings

• Answer the following questions

  – What RE-AIM dimensions are targeted for intervention and which can be described, but won’t be targeted for intervention?

  – How would you assess each RE-AIM dimension?

  – What challenges did you have?
Take home points

- RE-AIM is an outcomes framework that can be used for planning and evaluation

- Each dimension is an opportunity for intervention

- RE-AIM can be used for efficacy, effectiveness, and implementation science projects

- All dimensions can be addressed within a given study (though likely not all intervened upon)

- Methods exist to combine and summarize RE-AIM outcomes
Areas for future research

• More interventions to improve reach, adoption, implementation, and maintenance of evidence-based interventions

• Identification of new research designs that can provide relevant and actionable information for practice organizations and professionals

• Validation of metrics that combine RE-AIM indicators and link metrics to public health changes
Mission:
Producing a Public Health Impact through Physical Activity, Nutrition, & Weight Management Interventions

Translational Obesity Research Center

Producing a Public Health Impact through Physical Activity, Nutrition, & Weight Management Interventions
Fralin Translational Obesity Research Center and Interdisciplinary Graduate Education Program

Three Graduate Training Tracks:

- Behavioral & Community
- Basic
- Human Clinical Physiology and Metabolism

Core Courses in:
- Translational Science
- Team Science
- Research Methods

Areas of Research Emphasis

1. Causes and consequences of obesity and related disorders
2. Breaking the link between obesity and its associated health risks
3. Obesity management dissemination and implementation

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