GATHERING INFORMATION BEYOND EFFECTIVENESS TO ENHANCE DISSEMINATION:

USING THE RE-AIM FRAMEWORK FOR THE EVALUATION OF PHYSICAL ACTIVITY INTERVENTIONS

Chair: Greet Cardon
Discussant: Lisa Klesges
OBJECTIVES

- To introduce the RE-AIM framework for systematic evaluation of interventions
- To show the application of RE-AIM in evaluating physical activity interventions in various settings
- To discuss the possibilities RE-AIM offers in disseminating intervention actions into practice
- To bring out the challenges related to the use of RE-AIM in dissemination studies.
CONTENT

- **Paul Estabrooks**: Introduction to the RE-AIM framework
- **Katriina Kukkonen-Harjula**: Evaluating a nationwide Physical activity prescription program
- **Ragnar Van Acker**: Evaluating the 10,000 steps whole-community project in Flanders
- **Genevieve Dunton**: Using the RE-AIM Framework to Evaluate the Statewide Dissemination of a School-based Physical Activity and Nutrition Curriculum: Exercise Your Options.

- **Lisa Klesges** will lead the discussion on practical issues of applying the RE-AIM framework
Contributors:

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The Fundamentals of the RE-AIM Framework

Paul Estabrooks, PhD
Virginia Tech Translation Obesity Research Program

www.re-aim.org
RE-AIM: Rationale to Improve Research-Practice translation

• Expanding metrics beyond efficacy and effectiveness
  • To broaden the criteria to include external validity

• Evidence that is contextual, practical, & robust

• Re-consider the appropriate philosophy of science
  • Isolating/simplifying versus studying programs in context and the impact of different contextual factors
RE-AIM goals for interventions

- Be widely *adopted* by different sites
- Have the ability for *sustained* and consistent *implementation* at a reasonable cost
- *Reach* large numbers of people, especially those who can most benefit
- Produce *replicable* and *long-lasting* effects (and minimal negative impacts)

Klesges, et al. AB M, 2005; Green & Glasgow, Eval Health Professions, 2006; [www.re-aim.org](http://www.re-aim.org)
The RE-AIM Framework:

- Reach
- Effectiveness
- Adoption
- Implementation
- Maintenance

Glasgow et al, AJPH, 1999
Definition: The number, percent of target audience, and representativeness of those who participate.

Data Needed:

- **Denominator**—*number of eligible contacted for potential participation*
- **Numerator**—*number of eligible that participate*
- Comparative information on target population
RE-AIM ELEMENTS: REACH

Example:

Data:

Denominator—*Inactive or insufficiently active attending well visit* (n=1518 total; 607 eligible; 218 referred)

Numerator—*number of eligible that participate* (n=115)

Participation Rate: 115/607 = 19%

Almeida et al. JSEP 2005
### RE-AIM ELEMENTS: REACH

<table>
<thead>
<tr>
<th>Enrolled Participants</th>
<th></th>
<th></th>
<th>Census Tract</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Sample (n=115)</td>
<td>Stimulus Control (n=44)</td>
<td>Standard Care (n=71)</td>
</tr>
<tr>
<td>Female</td>
<td>60.9%</td>
<td>65.9%</td>
<td>57.7%</td>
</tr>
<tr>
<td></td>
<td>(±11.9)</td>
<td>(±11.3)</td>
<td>(±12.3)</td>
</tr>
<tr>
<td>White</td>
<td>58.9%</td>
<td>56.8%</td>
<td>60.3%</td>
</tr>
<tr>
<td>Black</td>
<td>22.3%</td>
<td>27.3%</td>
<td>19.1%</td>
</tr>
<tr>
<td>Latino</td>
<td>12.5%</td>
<td>6.8%</td>
<td>16.2%</td>
</tr>
<tr>
<td>Asian</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Almeida et al.  JSEP 2005
RE-AIM ELEMENTS: EFFECTIVENESS

Definition: Change in outcomes and impact on quality of life and any adverse outcomes

Data needed:

Primary Outcome
Quality of life
Potential negative outcomes
Example: Family Connections

Data:

Primary Outcome: Significant reductions in BMI z-score.

Quality of life: Improvement in quality of life with lower weight status

Potential negative outcomes: No evidence of heightened eating disordered symptoms

Estabrooks et al. AJPM 2009
Shoup et al. QLR 2008
RE-AIM ELEMENTS: ADOPTION

Definition: Number, percent and representativeness of settings and educators who participate.

Data needed:

Denominator—*number of eligible sites contacted for potential participation*

Numerator—*number of eligible sites that participate*

Comparative information on target population of sites
RE-AIM ELEMENTS: ADOPTION

Example:

Data:

Denominator—105 counties in Kansas eligible to participate

Numerator—48 agreed; 48/105=46%

Representativeness—Less active agent, less likely to deliver; Smaller population counties, more likely to deliver

Estabrooks, Bradshaw, Fox, et al., AJHP, 2004
Estabrooks, Bradshaw, Dzewaltowski, & Smith-Ray, ABM, 2008
RE-AIM ELEMENTS: IMPLEMENTATION

**Definition:** Extent to which a program or policy is delivered consistently, and the time and costs of the program.

**Data needed:**
- Information on program components and essential elements
- Information on resource use
Example:

Data:

All program components delivered as intended

2.5 hours of delivery agent time per participant compared to 36 hrs per participant in control
RE-AIM\textsuperscript{M} ELEMENTS: MAINTENANCE

Definition:

Individual/member target: Long-term effects and attrition.

Setting/educator: Extent of discontinuation, modification, or sustainability of program.

Data needed:

Primary outcome assessment 6 months post intervention

Documented sustained delivery
RE-AIM Elements: Maintenance

Data:

Decreased BMI z-scores sustained 6 months after intervention complete

Data:
Presenting RE-AIM Data

- Textually (previous examples)
- Graphically
- Quantitatively
Future Directions

• Comparative trials that use composite measures of RE-AIM.
  
  • Individual Level Impact
    • RE: Reach X Effectiveness
    • RE2: Problem Prevalence X RE (Attributable Individual Level Impact)
    • RE3: Incremental cost of treatment-control/Incremental RE of Treatment-control (Efficiency)
  
  • Setting Level Impact
    • AI: Setting Adoption X Staff Adoption X Implementation
    • AI2: AI X number of target settings X Average number served per setting
  
  • RE-AIM Average

Glasgow, Klesges, Dzewaltowski, Estabrooks, & Vogt, 2006
Evaluating national Physical Activity Prescription Program (PAPP) in Finland

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www.ukkinstituutti.fi/en
From innovation to practice: initiation, implementation and evaluation of a physician-based physical activity promotion programme in Finland

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SUMMARY
In 2001, a collaborative Physical Activity Prescription Programme (PAPP) was started in Finland to increase physical activity (PA) counselling among physicians, especially in primary care. This article describes the initiation, implementation and evaluation of PAPP.

Five actions were implemented to reach the programme goal: (i) developing a counselling approach for physicians; (ii) providing easy and open access to counselling material; (iii) facilitating physicians’ uptake and adoption of the counselling approach; (iv) disseminating information about the counselling approach to physicians, health and exercise professionals and decision-makers and (v) raising financial resources to cover programme expenses. Evaluation was based on the dimensions of the RE-AIM framework: reach, effectiveness, adoption, implementation and maintenance. Effectiveness and adoption were evaluated with two questions added to the annual survey of the Finnish Medical Association to all practising physicians in the year 2002 (n = 16 692) and 2004 (n = 17 170).

The 4-year PAPP was successful in reaching health care units (Reach), accomplishing most of the implementation actions (Implementation) and initiating local projects for institutionalization of the prescription-based counselling approach, ‘Prex’ (Maintenance). However, at the national level, the programme was not effective in increasing the frequency of asking about patients’ PA habits (Effectiveness) or the frequency of using ‘Prex’ or other written material in PA counselling among physicians (Adoption).

To improve the latter two, the duration of the programme would have had to be extended with more effort at strengthening physicians’ confidence in PA counselling and knowledge about its effectiveness. Also, a more systematic approach would have been necessary to facilitate inter-sectoral network for adopting ‘Prex’ as a counselling tool at the local level.

Key words: physical activity; promotion; primary health care; dissemination

INTRODUCTION
In 2001, a collaborative Physical Activity Prescription Programme (PAPP) was started in Finland to increase physical activity (PA) counselling among physicians, especially in primary care. The ultimate aim of the programme was to promote the health-enhancing PA (U.S. Department of Health and Human Services, 1996) of sedentary patients thereby preventing and reducing possible health problems related to physical inactivity. Physicians’ role was emphasized, because (i) their services were used by 82% of the population yearly (Helakorpi et al., 2005); (ii) fewer than 30% of physician appointments included PA counselling according to
Physical Activity Prescription Program (PAPP) in 2001-4

- Finnish Rheumatism Association Programme
- Finnish Medical Association Association
- Research Center for Health Promotion (University of Jyväskylä)
- Fit for Life
- Finnish Heart

www.liikkumisresepti.net
INITIATION OF THE PROGRAM
Recruitment of collaborating organisations
Formulation of working principles
Setting the goal: to increase PA counseling among primary care physicians

ACTIONS FOR REACHING THE PROGRAM GOAL
1. Developing a counseling approach for physicians
2. Providing easy and open access to counseling material
3. Facilitating the uptake and adoption of the counseling approach
4. Disseminating information about the counseling approach to physicians, health and exercise professionals and decision-makers
5. Raising financial resources to cover the programme expenses

EVALUATION OF THE PROGRAM WITHIN THE FRAMEWORK OF RE-AIM
Reach, Effectiveness, Adoption, Implementation, Maintenance
(Glasgow et al. 1999, www.re-aim.org)
# RE-AIM evaluation

<table>
<thead>
<tr>
<th>Question</th>
<th>Indicator</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>R to what extent was PA Prescription (PAP) material requested by health care units?</td>
<td>number &amp; coverage of subscriptions</td>
<td>records of Finnish Medical Association (FMA)</td>
</tr>
<tr>
<td>E to what extent did the frequency of asking about patients’ PA habits increase among physicians?</td>
<td>change at national level from 2002 to 2004</td>
<td>annual surveys of FMA to members in 2002 (N=16692) &amp; 2004 (N=17170)</td>
</tr>
<tr>
<td>A to what extent did the frequency of using PAP or other written material in PA counselling increase among physicians?</td>
<td>change at national level</td>
<td>annual surveys of FMA</td>
</tr>
<tr>
<td>I to what extent were the implementation actions accomplished?</td>
<td>- developing a counseling approach for physicians - providing easy &amp; open access to the material - facilitating uptake &amp; adoption - disseminating information to physicians, health &amp; exercise professionals &amp; decision-makers - raising financial resources to cover expenses</td>
<td>process evaluation</td>
</tr>
<tr>
<td>M to what extent was the number of local projects, visibility</td>
<td>number of local projects, visibility</td>
<td>process evaluation</td>
</tr>
</tbody>
</table>
Reach - to what extent was PAP material requested by health care units?

Number and coverage of subscriptions: records of Finnish Medical Association, who delivered the material.

3048 blocks of prescriptions
- 50% municipal health care centers (MHC)
- 15% occupational health centers (OHC)
- 24% local projects
- 11% hospitals, private clinics and rehabilitation centers

- 34% of all MHC and 7% of all OHC requested material
- Southern and western parts of Finland were the most active

Effectiveness
- to what extent did the frequency of asking about patients’ PA habits increase among physicians?

change at national level

annual surveys of FMA to all members in
2002 (N=16692)
2004 (N=17170)

“How many of your patients do you ask about their physical activity habits?”

<table>
<thead>
<tr>
<th>Respondents %</th>
<th>Proportion of respondents asking about PA habits from at least one out of 3 patients</th>
<th>2002</th>
<th>2004</th>
<th>Change in proportions % units</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (N=9435)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>male</td>
<td></td>
<td>44.9</td>
<td>61.8</td>
<td>64.3</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.2 to 3.8</td>
</tr>
<tr>
<td>female</td>
<td></td>
<td>55.1</td>
<td>67.4</td>
<td>68.9</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.3 to 2.7</td>
</tr>
<tr>
<td>Age in 2002 (N=9435)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;35</td>
<td></td>
<td>18.7</td>
<td>58.8</td>
<td>58.8</td>
<td>-0.1</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-2.4 to 2.3</td>
</tr>
<tr>
<td>35-44</td>
<td></td>
<td>31.8</td>
<td>65.2</td>
<td>68.1</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.4 to 4.4</td>
</tr>
<tr>
<td>45-54</td>
<td></td>
<td>34.6</td>
<td>68.4</td>
<td>70.3</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.5 to 3.3</td>
</tr>
<tr>
<td>≥55</td>
<td></td>
<td>14.9</td>
<td>63.7</td>
<td>66.1</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.2 to 4.6</td>
</tr>
<tr>
<td>Primary working place in 2002 N=8827</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital, rehabilitation centre, hospice</td>
<td></td>
<td>47.0</td>
<td>60.1</td>
<td>62.1</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.7 to 3.3</td>
</tr>
<tr>
<td>Municipal health centre</td>
<td></td>
<td>28.4</td>
<td>73.3</td>
<td>76.0</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.9 to 4.5</td>
</tr>
<tr>
<td>Private clinic</td>
<td></td>
<td>11.2</td>
<td>57.2</td>
<td>57.5</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-2.1 to 2.7</td>
</tr>
</tbody>
</table>
Adoption
- to what extent did the frequency of using prescription or other written material in PA counseling increase among physicians?

change at national level

annual surveys of FMA to all members in
2002 (N=16692)
2004 (N=17170)

“To how many patients do you give prescription or other written material to support verbal advice on physical activity?”

<table>
<thead>
<tr>
<th></th>
<th>Respondents</th>
<th>Proportion of respondents using written material in PA counseling with at least one out of 3 patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>2002</td>
</tr>
<tr>
<td>Gender (N=8629)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>male</td>
<td>44.5</td>
<td>13.1</td>
</tr>
<tr>
<td>female</td>
<td>55.5</td>
<td>11.5</td>
</tr>
<tr>
<td>Age (N=8629)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;35</td>
<td>19.4</td>
<td>7.6</td>
</tr>
<tr>
<td>35-44</td>
<td>32.1</td>
<td>11.0</td>
</tr>
<tr>
<td>45-54</td>
<td>34.2</td>
<td>14.3</td>
</tr>
<tr>
<td>≥55</td>
<td>14.3</td>
<td>16.3</td>
</tr>
<tr>
<td>Primary working place in 2002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=8074</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital, rehabilitation centre,</td>
<td>46.9</td>
<td>11.3</td>
</tr>
</tbody>
</table>
Implementation - to what extent were the program actions accomplished?

Process evaluation

1. Developing a counseling approach for physicians

Pilot study  ➔  Prescription form

# PHYSICAL ACTIVITY PRESCRIPTION

Name: ___________________________  Identity code: _______________________

Current regular physical activity of at least 30 minutes per day:

- [ ] Hardly any
- [ ] Light physical activity _______ days a week
- [ ] Moderate physical activity _______ days a week
- [ ] Hard physical activity _______ days a week

From a health point of view
- [ ] Adequate
- [ ] Inadequate

Health basis or goal of physical activity: ________________________________

### INSTRUCTIONS:

<table>
<thead>
<tr>
<th>Form of physical activity and/or sport</th>
<th>Days per week</th>
<th>Duration per day</th>
<th>Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eg. walking to place of work or hobby, mowing the lawn, shoveling snow, cycling to work, walking for fitness, home gymnastics, exercise classes, ball games, dancing, gym training</td>
<td></td>
<td>minutes</td>
<td>light + hardly out of breath, moderate + somewhat out of breath, hard + very out of breath, heart rate range</td>
</tr>
</tbody>
</table>

Additional advice:

- [ ] Leaflet
- [ ] Appointment with ___________________________  Tel. ___________________________
- [ ] Other ___________________________

Assessment and monitoring:

- [ ] At next appointment ___________________________  Tel. ___________________________
- [ ] After _________ months at ___________________________  Tel. ___________________________
- [ ] Other ___________________________

Date: ___________________________  ___________________________  Physician’s signature

### Assess & Advise
- Current PA
- Readiness to increase PA
- PA guidelines
- Benefits of increasing PA

### Agree
- Individual PA goal
- Weekly PA plan

### Assist & Arrange
- Co-operation
- Systematic support
Follow-up card
2. Providing easy and open access to the material
   - webpages
     www.liikkumisresepti.net
   - Finnish Medical Association

3. Facilitating uptake and adoption
   - **4 peer-trainings:** 76 peer-trainers
   - **user’s trainings:** 19% of all MHC physicians, 16% of all OHC physicians in Finland
   - pilot **electronic version** of the prescription for patient records
   - a randomized, controlled study on the effectiveness
A randomized intervention of physical activity promotion and patient self-monitoring in primary health care

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c School of Public Health, Tampere University, Finland

Available online 16 November 2005

Abstract

Objectives. To examine the effectiveness of prescription-based counseling and self-monitoring in the promotion of physical activity in primary health care.

Methods. The study was conducted in Finland during 2003-2004. Physicians from 24 health care units (N = 67) were randomized to a prescription or a non-prescription group. The patients (N = 265) were assigned to the groups according to their physician. Every other patient of the non-prescription physicians received a pedometer and a physical activity log (MON) and feedback about their 5-day-recordings, the rest served as controls (CON). PA was assessed prior and 2 and 6 months after the physician’s appointment with a questionnaire.

Results. The mean increase in weekly overall physical activity at 2 months was 1.0 (95% CI 0.0 to 2.0) session more in the prescription group than in controls. In at least moderate-intensity physical activity, the mean difference in changes was 0.8 (95% CI 0.1 to 1.5) sessions at 2 months and 0.9 (95% CI 0.2 to 1.5) sessions at 6 months for the favor of the prescription group. Compared to controls, self-monitoring increased the weekly duration of overall PA at 2 months on average by 217 min (95% CI 23 to 411).

Conclusions. Prescription can be recommended as a tool for primary health care physicians to promote physical activity. Self-monitoring with an expert feedback can be useful in increasing especially the weekly duration of overall physical activity in the short term.

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Keywords: Physical activity; Counseling; Physician; Effectiveness; Primary health care

Introduction

There is increasing evidence about the benefits of physical activity (PA) in the prevention and treatment of major public health diseases [4,10,25,35]. Still, less than half of the adult population in most developed countries fulfills the recommendation of sufficient PA for purposes of health [25,37].

During the last decade, encouraging results about the effectiveness of physician-delivered counseling have been achieved to increase PA of sedentary persons [6,12,14,17,26,30,32]. However, the effects seem to dilute in the long term, which is presumed to arise from the physicians’ inability to integrate the key components of counseling, such as control visits and cowork with other health staff, to the counseling procedure [34]. Self-monitoring has also been brought up as a method for PA promotion especially after the development of accurate electronic pedometers [33]. Pedometers are easy to use, inexpensive and less time consuming than counseling based on conversation. The use of such devices can have a positive influence on PA at least in the short term [8,31,41].

This randomized controlled trial examines the feasibility and effectiveness of prescription-based PA counseling by physicians, “Prex” (Fig. 1), developed and piloted in Finland during 2001-2002 [21]. To gain information about the effects of a less time consuming method, self-monitoring with a pedometer and PA log was also studied.

Subjects and methods

Recruitment of health care units and physicians

Municipal primary health care centers (PHC) and occupational outpatient health care units (OHC), both private- and community-owned with more than four physicians and within the reach of less than 2 h traveling time from the
4. Disseminating information to physicians, health and exercise professionals and decision-makers

- **49 events**, 3555 participants
- **8 articles** in professional journals, referred to in 69 newspaper articles, 33 articles in health and exercise magazines, 8 articles in other magazines, referred to in 7 TV and 5 radio programs
- **1480 information leaflets** mailed to physicians in hospitals, private clinics and rehabilitation centres
- collaboration with the six Finnish Centres of Exercise Medicine

Physicians start to write physical activity prescriptions.

Unfortunately we do not have these as pills, you have to do these exercises by yourself.
5. Raising financial resources to cover expenses

- primary funding from the Ministry of Social Affairs and Health
- additional funding from other resources
  - programme costs of 266,000 €
    - including 117,600 € of the collaborative organisations’ own funding (working hours)
Maintenance
- to what extent was the counseling approach institutionalised?

number of local projects, visibility in national documents

• 14 local projects
• a recommended practice in 2 nationally important public health documents
Physical Activity Prescription Program

Summary

Reach +
Effectiveness ±
Adoption ±
Implementation +
Maintenance +

Major strengths of the program

Physical Activity Prescription Program

1) The program was multi-organizational enabling the use of allied resources for dissemination.

2) Prescription was developed in a pilot study and scientifically based on best practices of counseling.

3) Information on effectiveness and adoption was collected before and after the program as part of national survey.

4) The number of peer-trained physicians was large indicating need for disseminating information on physical activity counseling more widely.

5) The proportion of primary health care physicians participating in user’s trainings was large indicating need for gaining more information on physical activity counseling.

6) RCT was conducted on the effectiveness & feasibility of the prescription.

7) The number of local prescription projects was large indicating need for developing counseling practices.

Major limitations of the program

1) Duration of the program was too short for uptake and adoption.
2) Data on effectiveness and adoption was based on physicians’ self-reports.
3) Inability to prepare an electronic prescription to patient records.
4) Insufficient actions to strengthen physicians’ attitudes, knowledge and confidence in physical activity counseling.
5) Actions at national level were not able to provide support for local projects and collaboration.
6) Evidence on the effectiveness should have been available in the beginning of the program for facilitating the uptake and adoption of the prescription.

Project PAPP in 2001-4

6 collaborators: coordination, peer training, material, promotion, research

Training of physicians in primary health care by regional peer trainers

Primary health care
- written exercise prescriptions
- user’s training by peer physicians
- cooperation with exercise organizers

Exercise organizers
- HEPA groups
- other exercise services
- cooperation with primary health care
The impact of disseminating the whole-community project ‘10,000 Steps’: a RE-AIM analysis

Ragnar Van Acker, Ilse De Bourdeaudhuij, Katrien De Cocker, Greet Cardon

Department of Movement and Sport Sciences, University of Ghent, Ghent, Belgium

Annual Meeting ISBNPA
9 – 12 June 2010; Minneapolis (US)
Introduction
Some steps back into history

- Successful pilot study of ‘10,000 Steps Ghent’
- Increase of 8% reaching the 10,000 steps per day standard
- Whole-community project with a socio-ecological approach…

(De Cocker et al., 2007)
**Elke stap telt!**

**Het project**

De bewoners zijn er, Vlamingen bewegen te weinig om gezond te zijn. Uit de Vlamingen te weinig beweegt en handel nico loopt op: vrijetracties, dartkinderen, ongevorderd, diabetes, ...)

**Promotie van een actieve levensstijl**

De onderzoeksgroep Fysieke Activiteit, FIL (Faculteit Geneeskunde en Gezondheidszorg) van de Universiteit Gent, samen met het Steunpunt Cultuur, Jeugd en andere partners, initieert dit groeiende gezondheidsprobleem aan te staan worden zoveel mogelijk actoren geinspireerd om bij de 10 000stappen op een duurzame wijze (niet éénmalig) uit te werken.

**Dagelijks 10.000 stappen zetten**

**Nieuw project om lichaam te doen bewegen**

**GENT - We bewegen te weinig en daar wil de Gentse Universiteit samen met de stad iets aan doen. Het project 10.000 stappen moet de Gentenaar motiveren om meer beweging te nemen. Een duo-walk, te koop bij het stappen kantoor. En dat alleen zijn..**

- de Wamgani beweegt te weinig, vooral op bovenste piek. Om het probleem aan te pakken, slopen de stad Gent en de provincie uted en elkaar. De campagne wordt als een Gent.

**en...**

- een dag probeert en na ondubbelzinnig een uitgebreide en andere regio's. De terreinten zijn niet in de richting van een en. De minimale bewegingsnorm, dertig kilometer, kan worden gelijkgesteld aan starten en daarbij een handige stelletje ter hoogte van de heup elke stap die gezet wordt:

- en lanceren het materieel en daarvan.
Project components 10,000 Steps

All PA contexts
Recurrent

1. Flyers
2. Posters in public places
3. Street signs
4. Media
5. Community events
6. Pedometer package
7. Partnerships
8. Website
9. Personal contact
Introduction
Purpose of the present study

• Report on the dissemination and implementation of projects based on 10,000 Steps in the wider region of Flanders

• Application of the RE-AIM framework (Glasgow et al. 1999)
Flanders:
- Population: 6,160,600
- Surface: 13,521 km²
- Density: 456 inhabitants / km²

Ghent:
- Population: 229,000
- Surface: 156 km²
- Density: 1,468 inhabitants / km²
Methods
Dissemination strategies

- Media strategies
- Interpersonal contact through peer networks
Methods
Dissemination strategies

• Media strategies
• Interpersonal contact through peer networks
Methods
Data collection and instruments

• Organizational level: online questionnaire
  ‣ Awareness
  ‣ Adoption
  ‣ Implementation
  ‣ Continuation

• Individual level: interviews
  ‣ Awareness
  ‣ Levels of physical activity (IPAQ - long version)

Annual Meeting ISBNPA
9 – 12 June 2010; Minneapolis (US)
Methods

Measures

• **Reach**: % of eligible citizens that were aware of 10,000 Steps projects

• **Effectiveness** (2 levels):
  - % of eligible organizations that were aware of the 10,000 Steps project
  - comparison of citizens’ physical activity levels

• **Adoption**: % of organizations that adopted 10,000 Steps
Methods

Measures

• **Implementation:** median implementation score (score on 100) across all nine project components and all organizations that adopted 10,000 Steps as a whole-community approach

• **Maintenance:** % of organizations with the intention to continue implementation
Methods - Population

Org.level

Total number of potential organizations: \( N = 381 \)

A random sample of organizations: \( n = 69 \)

Adoption of 10,000 Steps as a whole-community approach:

\( n = 21 \)

Ind.level

Total number of potential citizens: \( N = 503,800 \)

A random sample of potential citizens: \( n = 2,600 \)

Citizens eligible (completed interview): \( n = 755 \)
Methods - Population

**Org.level**

- Total number of potential organizations: $N = 381$

  - A random sample of organizations: $n = 69$

  - Adoption of 10,000 Steps as a whole-community approach: $n = 21$

**Ind.level**

- Total number of potential citizens: $N = 503,800$

  - A random sample of potential citizens: $n = 2,600$

  - Citizens eligible (completed interview): $n = 755$
Results

Effectiveness (organisational level)

→ 90% (n=62) of organizations knew 10,000 Steps

Most cited information sources (% of organizations)

<table>
<thead>
<tr>
<th>Information Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provincial government and service</td>
<td>32 %</td>
</tr>
<tr>
<td>Association of local health services</td>
<td>27 %</td>
</tr>
<tr>
<td>Ghent University and Flemish Research Policy Center</td>
<td>25 %</td>
</tr>
<tr>
<td>Peer organizations</td>
<td>24 %</td>
</tr>
</tbody>
</table>
# Results

Adoption = 36% of organizations (n=21)

## Comparison between adopting vs. non-adopting organizations

<table>
<thead>
<tr>
<th></th>
<th>Adopting group</th>
<th>Non-adopting group</th>
<th>t/χ² (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N of staff members</td>
<td>4.1 ± 2.9</td>
<td>5.6 ± 11.1</td>
<td>0.7 (ns)</td>
</tr>
<tr>
<td>(mean ± SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of org (%)</td>
<td>76.0</td>
<td>56.8</td>
<td>2.5 (ns)</td>
</tr>
<tr>
<td>health focus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban context (%)</td>
<td>16.0</td>
<td>13.6</td>
<td>0.1 (ns)</td>
</tr>
</tbody>
</table>

Annual Meeting ISBNPA
9 – 12 June 2010; Minneapolis (US)
## Results

### Adoption (2)

<table>
<thead>
<tr>
<th></th>
<th>Project staff</th>
<th>Non-project staff</th>
<th>t/χ² (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience in yrs (mean ± SD)</td>
<td>7.6 ± 4.6</td>
<td>2.9 ± 5.9</td>
<td>2.8 (p&lt;0.01)</td>
</tr>
<tr>
<td>Age in yrs (mean ± SD)</td>
<td>39.7 ± 8.5</td>
<td>36.4 ± 9.9</td>
<td>0.3 (ns)</td>
</tr>
<tr>
<td>Gender (%) men</td>
<td>28.6</td>
<td>50.0</td>
<td>4.0 (p&lt;0.05)</td>
</tr>
</tbody>
</table>
## Results

**Implementation: global score = 52 on 100**

<table>
<thead>
<tr>
<th>Project component</th>
<th>Implementation mean score on 100 ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedometers</td>
<td>90.5 ± 30.7</td>
</tr>
<tr>
<td>Community events</td>
<td>87.5 ± 34.2</td>
</tr>
<tr>
<td>Flyers</td>
<td>76.2 ± 34.0</td>
</tr>
<tr>
<td>Media</td>
<td>64.3 ± 42.3</td>
</tr>
<tr>
<td>Website</td>
<td>52.4 ± 51.2</td>
</tr>
<tr>
<td>Partnerships</td>
<td>37.5 ± 45.5</td>
</tr>
<tr>
<td>Posters</td>
<td>35.7 ± 45.1</td>
</tr>
<tr>
<td>Street signs</td>
<td>19.0 ± 37.0</td>
</tr>
<tr>
<td>Personal contact</td>
<td>17.2 ± 28.5</td>
</tr>
</tbody>
</table>
# Results

## Reasons for non-implementation

<table>
<thead>
<tr>
<th>Partnerships</th>
<th>% of orgs.</th>
<th>Posters in public places</th>
<th>% of orgs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No time</td>
<td>36%</td>
<td>Need for more information</td>
<td>55%</td>
</tr>
<tr>
<td>No added value for the project</td>
<td>27%</td>
<td>Not relevant to our core business</td>
<td>45%</td>
</tr>
<tr>
<td>Not relevant to our core business</td>
<td>27%</td>
<td>Still considering implementation</td>
<td>9%</td>
</tr>
</tbody>
</table>
## Results

### Reasons for non-implementation (2)

<table>
<thead>
<tr>
<th>Street signs (scene)</th>
<th>% of orgs.</th>
<th>Personal contact</th>
<th>% of orgs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need for more information</td>
<td>55%</td>
<td>No time</td>
<td>33%</td>
</tr>
<tr>
<td>Not relevant to our core business</td>
<td>45%</td>
<td>Not relevant to our core business</td>
<td>33%</td>
</tr>
<tr>
<td>Too expensive</td>
<td>9%</td>
<td>Too expensive</td>
<td>17%</td>
</tr>
</tbody>
</table>

Annual Meeting ISBNPA
9 – 12 June 2010; Minneapolis (US)
Targeted domains of active living

- leisure-time
- active transport
- work-related
- household

% of adopting organizations
Maintenance

- Intention to continue 10,000 Steps projects: 33% of organizations

- Undecided: additional 48% of organizations
Results

Reach = 35% of citizens (n = 261)

Comparison between citizens aware and unaware of 10,000 Steps

<table>
<thead>
<tr>
<th></th>
<th>Aware</th>
<th>Unaware</th>
<th>t/χ² (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs mean ±SD)</td>
<td>50.4 ± 14.5</td>
<td>50.8 ± 16.0</td>
<td>0.3 (n.s.)</td>
</tr>
<tr>
<td>Gender - Men (%)</td>
<td>36.4</td>
<td>43.3</td>
<td>1.3 (n.s)</td>
</tr>
<tr>
<td>Coll. or university degr. (%)</td>
<td>39.5</td>
<td>39.3</td>
<td>0.0 (n.s.)</td>
</tr>
<tr>
<td>Employed (%)</td>
<td>77.1</td>
<td>72.3</td>
<td>0.7 (n.s)</td>
</tr>
</tbody>
</table>
## Results

### Reach – information sources

<table>
<thead>
<tr>
<th>Source</th>
<th>% of reached citizens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print media</td>
<td>33 %</td>
</tr>
<tr>
<td>(Regional) television</td>
<td>21 %</td>
</tr>
<tr>
<td>Health (insurance) services</td>
<td>18 %</td>
</tr>
<tr>
<td>Friends &amp; family</td>
<td>13 %</td>
</tr>
<tr>
<td>Radio</td>
<td>12 %</td>
</tr>
</tbody>
</table>
## Results

**Effectiveness – individual level**

<table>
<thead>
<tr>
<th>Physical activity (PA) levels of citizens aware and unaware of 10,000 Steps</th>
<th>Aware</th>
<th>Unaware</th>
<th>t(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PA for transportation</strong></td>
<td>128 ± 161</td>
<td>116 ± 165</td>
<td>-0.9 (ns)</td>
</tr>
<tr>
<td><strong>Leisure time PA</strong></td>
<td>256 ± 237</td>
<td>207 ± 216</td>
<td>-2.8 (p&lt;0.01)</td>
</tr>
<tr>
<td><strong>PA around the house</strong></td>
<td>420 ± 384</td>
<td>412 ± 439</td>
<td>-0.3 (ns)</td>
</tr>
<tr>
<td><strong>PA at work</strong></td>
<td>282 ± 454</td>
<td>310 ± 494</td>
<td>0.4 (ns)</td>
</tr>
</tbody>
</table>
## Conclusion

### Scores on the RE-AIM dimensions – overview

<table>
<thead>
<tr>
<th></th>
<th>Individual level</th>
<th>Organiz. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach</td>
<td>36 %</td>
<td></td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Only significantly higher values of leisure time PA in reached group</td>
<td>90 %</td>
</tr>
<tr>
<td>Adoption</td>
<td></td>
<td>36 %</td>
</tr>
<tr>
<td>Implementation</td>
<td></td>
<td>52</td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td>33 %</td>
</tr>
</tbody>
</table>
Conclusion

• RE-AIM framework allows for a more structured evaluation

• Media strategies and use of peer networks seem promising for creating project awareness among organizations

• Project adoption requires more time?
Conclusion

• Representativeness: project adoption (org. level) and project awareness (ind. level) are independent of most studied variables

• A more extensive support structure seems required to promote the quality of project implementation: linkage-system

• Follow-up study is required
Thank you for your attention!
Using the RE-AIM Framework to Evaluate the Statewide Dissemination of a School-Based Physical Activity and Nutrition Curriculum: “Exercise Your Options”

Genevieve F. Dunton, PhD, MPH
Renee Lagloire, MA
Trina Robertson, MS, RD
School-Based Obesity Prevention Programs

- Schools are a critical setting for obesity prevention

- Benefits of curriculum-based strategies:
  - Easily incorporated into the school day
  - Address educational standards
  - Require little additional time + cost

- Modest success for curriculum-based programs
  - 88% of studies effective for nutrition
  - 34% of studies effective for physical activity
  - 44% of studies effective for body composition

Dunton et al, in press
Limitations of School-Based Obesity Prevention Research

- Evaluations typically focus only on efficacy and effectiveness.

- Do not consider the overall public-health impact (i.e., number of people reached)

- The extent and ease with which they can be delivered to a large number of people.

Abrams et al., 1996
Vogt et al., 1998
RE-AIM Framework

- **Reach** (i.e., proportion of the target population that participated)
- **Efficacy** (i.e., success rate)
- **Adoption** (i.e., proportion of target settings involved)
- **Implementation** (i.e., extent to which the program was delivered as intended)
- **Maintenance** (i.e., extent to which the program was sustained over time).
“Exercise Your Options” (EYO)

- Teacher-delivered PA and nutrition curriculum for grades 6–8 (8 lessons).
- Student activity booklet, video clips, DVD/CD-ROMs, website, teacher guide.
- Free of charge to California teachers.
- Materials ordered online, by mail or by phone.
- Implemented in Science, Physical Education, Health, and other types of nutrition and wellness classes.
EYO Evaluation

• CA statewide dissemination (2002-2007)
• **Reach/Adoption/Maintenance** - assessed through archival database monitoring of orders for program materials.
• **Efficacy** - non-experimental design (one group with pre- and post-surveys) (2006-2007)
• **Implementation** - teacher surveys and classroom observations (2006-2007)
Sample Classrooms

• Convenience sample drawn from the statewide pool of classrooms teaching EYO (2006-2007).

• Eligibility criteria:
  (1) had not yet taught nutrition during that year.
  (2) were at a traditional calendar school.
  (3) could teach EYO from Jan-Feb.
  (4) able to use DVD component.

• 20 of the 86 teachers contacted (23%) meet the criteria and agreed to participate in the evaluation.

• Teachers received $75.00.
Measures

*Student pre- and post-surveys*- Physical activity, TV/DVD watching, and computer use/video-game playing, dairy, fruits, vegetables, and sugars/sweets (YRBS).

*Teacher surveys*- number of EYO lessons taught, satisfaction, perceptions of student interest, etc.

*Classroom observations*- Trained research staff observed percent of lesson content conveyed, whether presented in recommended order (4 out of 8 lessons).
• Combined, the program reached 234,442 middle-school students in CA (2006–2007 school year).

• Represents 50% of the available public school students in any one middle-school grade ($N = 490,000$ students). The EYO program is only offered to one grade per school.
**Efficacy**

Pre-Post Survey Differences in Outcome Behaviors

<table>
<thead>
<tr>
<th></th>
<th>Pre M (SD)</th>
<th>Post M (SD)</th>
<th>t (df)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA (days/week)</td>
<td>4.01 (2.15)</td>
<td>4.44 (2.07)</td>
<td>4.61 (15)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Video Games/Computer (hours/day)</td>
<td>1.68 (1.54)</td>
<td>1.37 (1.35)</td>
<td>-3.84 (15)</td>
<td>.002</td>
</tr>
<tr>
<td>TV/DVDs (hours/day)</td>
<td>1.57 (1.07)</td>
<td>1.41 (1.03)</td>
<td>-2.52 (15)</td>
<td>.024</td>
</tr>
<tr>
<td>Dairy (times/day)</td>
<td>2.84 (1.70)</td>
<td>3.14 (1.73)</td>
<td>2.87 (15)</td>
<td>.001</td>
</tr>
<tr>
<td>Fruit (times/day)</td>
<td>2.23 (1.56)</td>
<td>2.21 (2.12)</td>
<td>-0.40 (15)</td>
<td>.698</td>
</tr>
<tr>
<td>Vegetables (times/day)</td>
<td>1.15 (0.98)</td>
<td>1.17 (0.96)</td>
<td>-0.15 (15)</td>
<td>.885</td>
</tr>
<tr>
<td>Sugars/Sweets (times/day)</td>
<td>4.17 (3.09)</td>
<td>3.44 (2.81)</td>
<td>-7.00 (15)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>
ADOPTION

- 40% (1,606 out of approx. 4,000) middle-school teachers in CA ordered the program in 2006–2007.

- Type of orders:
  - 49% made by teachers who had not previously
  - 51% were re-supply orders

- How teachers learned about the program:
  - Peer referrals (62%)
  - Educational conferences (31%)
  - Exposure to program materials at school (7%)
IMPLEMENTATION

- 86% of the teachers reported implementing all eight of the EYO lessons.
- 75% of the lessons observed were implemented in the recommended order.
- Teachers conveyed 80–100% of the lesson content.
MAINTENANCE

- Total of 1,247,889 student workbooks requests.
- On average 1,868 teachers and 249,578 students used the program each year.
- 52 percent of teachers reordered the program while 48 percent ordered the program for the first time during the five-year period.
Summary

• **REACH**- In 2006-2007, the EYO program reached half of middle-school students in CA.
• **EFFICACY**- PA and intake of dairy products increased; watching TV/DVD’s, playing electronic games/computer use, and sugars/sweets decreased.
• **ADOPTION**- 42% of eligible middle-school teachers ordered the program materials.
• **IMPLEMENTATION**- 86% of classrooms taught all of the lessons.
• **MAINTENANCE**- From 2002-2007, 52% of teachers reordered the program from year-to-year.
Limitations

- No control group → cannot rule out historical and external influences

- Self-report PA and dietary intake instruments → vulnerable to recall biases and social desirability

- Only short-term (2 month) results are presented for the program efficacy component
Conclusions/ Future Directions

• The EYO program showed its potential for moderate to high public health impact.

• Still a paucity of research evaluating the large-scale dissemination of school-based obesity prevention interventions.

• Future research should seek to apply the RE-AIM assessment framework across a wider range of school-based programs and populations.
Thank You
DISCUSSION

Lisa M. Klesges
School of Public Health
University of Memphis
Available Dissemination Research Evidence

Dissemination and Implementation Research on Community-Based Cancer Prevention: A Systematic Review
Borsika A. Rabin, PhD, Russell E. Glasgow, PhD, Jon F. Kerner, PhD, M. Paula Klump, MPH, Ross C. Brownson, PhD

Context: An extensive array of effective interventions for the prevention of cancer exists, suggesting that evidence is ready for widespread use. However, few of these approaches have been extensively utilized in real-world settings. Further, little is known on how to best disseminate and implement them effectively.

A Systematic Review of Studies Evaluating Diffusion and Dissemination of Selected Cancer Control Interventions.
Ellis, Peter; Robinson, Paula; Ciliska, Donna; Armour, Tanya; Brouwers, Melissa; O'Brien, Mary Ann; Sussman, Jonathan; Raina, Parminder
Health Psychology, Vol 24(5), Sep 2005, 488-500

A randomized controlled trial evaluating the impact of knowledge translation and exchange strategies
Maureen Dobbins*¹, Steven E Hanna¹, Donna Ciliska¹, Steve Manske², Roy Cameron², Shawna L Mercer³, Linda O'Mara¹, Kara DeCorby¹ and Paula Robeson¹
Implementation Science, 2009
Dissemination Process

- Review of cancer prevention interventions in community settings focused on evidence-based dissemination
  - 25 unique studies (1980-2008) in smoking, healthy diet, physical activity and sun protection
  - *Low methodological quality, incomplete data reporting*
  - No strong evidence to recommend any one strategy as effective in promoting the uptake of interventions

- Conclusion: Small number of studies and heterogeneity of methods

Limited Translational Research

- **Funding Issues:**
  - 98.5% of research funding at Basic or T1
  - Only 1.5% on combined T2, T3, or T4 with most at T2 \(\text{(Woolf SH, JAMA, 2008)}\)

- **Empirical Literature:**
  - Review of 1,210 pubs from 12 leading public health journals, 89% coded as basic research and development \(\text{(Oldenburg, et al., Health Educ Res, 1999)}\)
NEED RESEARCH THAT IS RELEVANT

“Lack of consideration of external validity is the most frequent criticism by clinicians of RCTs, systematic reviews, and guidelines.”

Designing & Reporting for Translation?

- Plan for generalization and assess context
- Consider design elements in interventions that:
  - **Reach** large numbers, **representative** of target population
  - Are practical to **adopt** in various settings by staff reflective of local community
  - Be reasonably **implemented** and **adaptable** by settings
  - Produce relevant, **replicable**, **robust** effects (w/ minimal negative impacts) at reasonable cost
  - Capable of **long-lasting** effects and **sustainability**

Reporting Standards of Evidence

- Clinical Trials (T2)
  - CONSORT+

- Non-Randomized Designs (T1-T3)
  - RE-AIM
  - TREND
  - STROBE
  - QUERI

- Reporting Emerging Evidence – T4

- L.E.A.D. -- IOM, 2010
Recommendations

- Maintain focus on research-informed dissemination – influence researchers, funders, reviewers, and editors to move forward
- Develop more specific training programs in translational science (CTSA, Schools of Public Health, NIH/CDC training institutes)
- Develop program evaluation to measure and guide translation research especially in light of complexity science
Discussion

How should we move forward with dissemination research given the limited evidence at hand?

What are the best approaches for building a relevant evidence base for actionable dissemination research?

How might we bring change in “redesigning” our current methods to make research more context based?

What standards of evidence are needed to support research translation and decision making?

What aspects of generalizability are most relevant at this time for research and evaluation? Are RE-AIM elements sufficient?
Questions, Counterpoint, Discussion