Udvikling og evaluering af 'real-world' komplekte sundheds- og uddannelsesinterventioner

Peter Bentsen
Temagruppemøde, SundByNetværket
København, September, 2018
Agenda

- SDCC, SHPR, CHESS, PBEN
- Udvikling og evaluering
- Udeskole som eksempel
- Spørgsmål og kommentarer
Steno Health Promotion Research
Steno Health Promotion Research

• Start June 2010
• R&D department focusing on human and social change
• Staff: social science, pedagogy, anthropology, design, psychology, public health...
• Staff: 70 in 2018
• Collaboration with departments at SDCC and externally
• International department of excellence within 10 years
• Core funding: Novo Nordisk Foundation
Two main tasks

Research
• ‘Translational’ research in primary, secondary and tertiary prevention
• Development and evaluation of new methods
• Creation of evidence
• Knowledge about implementation in different sectors

Implementation
• Consultancy
• Design and customisation of tools for practice
• Education and dissemination
• Sparring in the clinic
• Assist in evaluation and monitoring

Research and implementation through cross-disciplinary collaboration
‘Intervention principles’

1. A positive and a broad concept of health: To work with a health concept including wellbeing and life quality as well as absence of disease. And to acknowledge that health is influenced by behaviour, lifestyle and living conditions.

2. Participation and active involvement of the target group: To focus on participatory approaches, which generate ownership as a precondition for sustainable change.

3. Empowerment and action competence: To focus on how individuals and groups gain action competence to manage their own life and influence their living conditions towards the promotion of health.

4. A ‘settings’ perspective: To take into account the influence of health and health promotion by the individual as well as by social and structural factors - emphasizing the importance of culture and context.

5. Equity in health: To focus on how the methods and educational approaches developed can help to reduce inequality in health - socially and globally.
Principled Promotion of Health

Five guiding principles for Health Promotion Research at Steno Diabetes Center

Article

Principled Promotion of Health: Implementing Five Guiding Health Promotion Principles for Research-Based Prevention and Management of Diabetes

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Abstract: Background: Based on widespread critique of the prevailing paradigm that has long characterized much of the work conducted within the field of health promotion, Steno Health Promotion Research has developed a comprehensive health promotion approach consisting of five principles that constitute the framework for a new intervention paradigm. The five principles are: (1) A broad and positive health concept; (2) Participation and involvement; (3) Action and action competence; (4) A setting perspective and (5) Equity in health. Objectives: To describe a comprehensive health promotion approach consisting of five principles, to present research and development projects based on this set of principles, and to discuss experiences and outcomes from implementing the health promotion principles in healthcare practice. Results and conclusion: The principle approach enables consolidation of hitherto disparate approaches into a single comprehensive approach. The principles have turned out to be both productive and effective “management tools” that have led to new discoveries, but also helped to identify limitations.

Keywords: health promotion; diabetes prevention; diabetes management; implementation; chronic disease

1. Introduction

“Health is created and lived by people within the settings of their everyday life where they learn, work, play and live” is a frequently quoted line from the Ottawa Charter [1]. Accordingly, researchers in health promotion point to the importance of positively involving different stakeholders in the intervention target group to promote competence-based, action-oriented, sustainable health and to prevent severe health inequalities [2–4]. Promoting health across a multitude of settings, and thereby increasing the complexity of the approaches, also increases the demand for complexity-oriented research methods of understanding, interpreting and structuring the ways in which outcomes are processed, managed and implemented [5].

Steno Health Promotion Research (SHPR) was established in Denmark in 2010 as a research and development unit within a humanistic and social research approach. In vision is to be a leader in research and development within the areas of prevention and management of diabetes. What sets us apart from other health promotion units is our use of a set of five health promotion principles that constitute the framework for a new intervention paradigm. Our aim is to develop a comprehensive and integrated approach consisting of innovative, effective and sustainable models for diabetes management and prevention, where the target population is at the center of all processes. The five principles are:

(1) A
‘Translational Research’

Research
Biology
Epidemiology
Psychology
....

Translation

‘Real Life’
Clinic
Communities
Schools
....

Development of intervention
Test of intervention
Evaluation of intervention
Implementation research
Development of intervention

- Design thinking
- Intervention mapping
- Action research
- ....

Test of intervention

- Surveys
- Observation
- Interviews
- Log books
- Reports
- ....

Evaluation of intervention

- Quasi-experiments
- Realistic evaluation
- RCT
- ....

Implementation research

- Health care system research
- Cost-effectiveness studies
- ....
Børn, unge & settings

Education

Health

School & Community Settings
A life course perspective

Capabilities to develop ... (health) literacy start earlier than are often thought, and children can become agents of change in their families and social groups (Hanson & Gluckman, Am j Clin Nutr 2011; 94)

NCDs develop gradually over the life course
Our approach is targeting the proximal determinants of the health of children and young people. We therefore focus on a combination of health promotion and educational research with a primarily focus on health, well-being and education in schools, local communities, and families.
Small impact for individuals but is considerable impact for the wider population (Rose 1992, 1985, 2001)

**The Bell-Curve Shift in Populations**

Shifting the whole population into a lower risk category benefits more individuals than shifting high risk individuals into a lower risk category.

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Action is needed!

Improving the **effectiveness** and **evidence** of health education, promotion and prevention intervention aiming at promoting children’s health and education is critical in public health and education.

Achieving effectiveness requires a **relevant model of intervention**, as well as **successful implementation**, involving multiple and interlocked factors.

Recent research pointed towards the **potential** of a **life course approach** and **settings-based interventions**.
Developing and evaluating complex interventions: new guidance

Prepared on behalf of the Medical Research Council by:
- Peer Craig, MRC Population Health Sciences Research Network
- Paul Deplea, Nuffield Department of Orthopaedic Surgery, University of Oxford
- Sally Macleod, MRC Social and Public Health Sciences Unit
- Susan Melia, Centre for Outcomes Research and Effectiveness, University College London
- Irwina Nazareth, MRC General Practice Research Framework
- Mark Petticrew, Department of Public Health and Policy, London School of Hygiene and Tropical Medicine

www.mrc.ac.uk/complexinterventionsguidance
MRC framework (2000) - framework for design and evaluation of complex interventions to improve health
Hvad var def. På en kompleks intervention (MRC guidelines anno 2000)

- Fokus på antallet af interagerende komponenter
- Mange dele der arbejder i synergi for at skabe en ændring
- Forskellige lag
- Setting
- Interventionen og konteksten tilpasses sig hinanden
Hvad var def. på en kompleks intervention (MRC guidelines anno 2008)

• En mindre lineær model
• Mere fokus på pilottest/udviklingsfasen
• Behov for at forstå processer lige så vel som resultater
• Konteksten spiller en endnu vigtigere rolle
Forskellen på et kompliceret og komplekst problem:
How does DECIPHER develop & evaluate interventions? Key principles

The MRC Framework

Ecological thinking

Co-production

Realist principles

Complex systems thinking
Temaer

- Ecological thinking
- Complex interventions within complex systems
- Intervention development process
- Intervention theory
- Co-production
- Reviews / role of existing evidence
- Developing logic models
- Case studies of developing interventions and logic models
• Dynamic system, levels influence each other
• Svært at gennemføre i praksis og dyr tilgang => lack of adoption
→ Opmærksomhed på de forskellige levels i interventionsudvikling
Complex interventions vs. interventions in complex systems

Komplekse interventioner (vs. komplicerede)
- Antal komponenter i en intervention (synergier)
- Antal organisatoriske niveauer som adresseres
- Variere interventionen mellem kontekster?

Interventioner som events i komplekse systemer (P. Hawe)
- Systems: activity settings, social networks, time
- Fokus på systemets kompleksitet fremfor interventionens
- “Intervention = an attempt to disrupt system dynamics to maximise health enhancing potentials of a system”
- Not a discrete set of actions but a process of change
Intervention development study

“A study that describes the rationale, decision making processes, methods and findings which occur between the idea or inception of an intervention until it is ready for formal feasibility, pilot or efficacy testing prior to a full trial or evaluation” (Hoddinot 2015)

• **Nyudvikling, tilpasning** til ny kontekst eller **optimering** af eksisterende intervention

• Kontekst er afgørende (Craig et al. 2018)
In progress:
* Intervention development guidance (INDEX study, lead Alicia O’Cathain)

* Feasibility and pilot trials guidance (GUEST study, lead Laurence Moore)
Why Build a Logic Model?

• Kan finde svage led og mulige modsigelser i den kausale kæde

• Kan identificere hvor aktører har forskellige forståelser af den kommende intervention

• Kan understøtte tildeling af ressourcer

• Kan identificere hvor kontekst og implementering kan “bringe programteorien i fare”
## Kellogg model (with suggested amendments)

<table>
<thead>
<tr>
<th>Antecedent System Influences:</th>
<th>Resources</th>
<th>Activities</th>
<th>Outputs</th>
<th>Short and Long term outcomes</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine how the problem is conceived, how we might intervene, and the parameters of intervention implementation</td>
<td>In order to accomplish our set of activities we will need the following</td>
<td>In order to address our problem we will conduct the following activities</td>
<td>We expect that once completed or underway these activities will produce the following evidence of service delivery</td>
<td>We expect that if completed or on-going these activities will lead to the following changes in 1-3 then 4-6 years</td>
<td>We expect that if completed these activities will lead to the following changes in 7-10 years</td>
</tr>
</tbody>
</table>

Systems are dynamic and the influence exerted on the intervention mechanisms (and implementation practices) will likely evolve and change.
Armstrong et al 2013, KT4LG project

**Process Evaluation**: Intervention reach, dose, quality, fidelity, cost/resources, barriers & enablers

**Assumptions**:
- Increased support & interaction through facilitated program will improve outcomes
- Knowledge, confidence and skills predict research use
- EIDM culture at system-level influences the EIDM culture and research use in organisations but requires individuals with knowledge, skills & confidence
- Innovation will spread through organisations and the system

**Contextual Factors**:
- Type of decision, type of use
- Decision-making structures/systems
- Council size and structure
Future Challenges: Are logic models too linear for events in complex systems?

• Svært at indfange hvordan konteksten interagerer med mekanismer for at skabe effekt, i et diagram.
• Logic models simplificerer en kompleks virkelighed?
• Hvor meget simplificering er nødvendig for at skabe mening inden for modellen?
• ...hvor meget er problematisk?
• Er logic models for orienterede mod interventionens effekter frem for system change?
• Hvordan integrerer vi kontekst?
• Hvordan integrerer vi implementeringspraksisser?
MRC framework (2008)
- framework for design and evaluation of complex interventions to improve health

**Development**
- Identifying the evidence base
- Identifying or developing theory
- Modelling process and outcomes

**Feasibility and piloting**
- Testing procedures
- Estimating recruitment and retention
- Determining sample size

**Implementation**
- Dissemination
- Surveillance and monitoring
- Long term follow-up

**Evaluation**
- Assessing effectiveness
- Understanding change process
- Assessing cost effectiveness
Formål

- at evaluere komplekse sundhedstiltag, sætte og gøre brug af forskellige rammer og teoretiske tilgange til forskning og anvende dem i forskning.

- en mere detaljeret forståelse af nogle af de centrale rammer for evaluering af forskellige former for komplekse sundhedsinterventioner og udfordringerne, begrænsningerne og fordelene ved at gennemføre disse.
Procesevaluering

I en procesevaluering evaluerer man de processer, som har fundet sted i et projekt. Procesevalueringen forsøger at undersøge, beskrive og forklare processen frem mod de målsætninger, man har med projektet.

To tilgange:
- For det første kan man ønske at opnå viden, der gør det muligt at korrigere et projekt undervejs i forløbet.
- For det andet kan man efter et projekt er afsluttet ønske sig viden om, hvilke processer der førte til de resultater, man opnåede.

Når man anvender procesevaluering er det som oftest, fordi man vil undersøge den proces, der har ført hen imod en indsats eller en forandring.
Processevaluering

Context

Planned Intervention

Implementation

Mechanisms of impact

Outcomes
Opsummering

• MRC guidelines er efterfølgelsesværdige i udvikling og evaluering af interventioner
• MRC guidelines udvikler sig over tid som en reaktion på udviklingen og kritik
• Meget debat fokuserer på selve definitionen af en kompleks indsats
• Procressevaluering er nødvendig for at forstå, hvordan interventioner generer effekter
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Udeskole som eksempel
The objective is to understand how regular EOtC influences PA, learning, social relations, motivation, and well-being among school children in 3rd to 6th grade (9-13 years of age).

Does EOtC increase and improve school children’s physical activity, academic learning, social relations, wellbeing, and motivation at school? And, if so, how?

Donation from the TrygFonden: 6.78 mio. DKK
Total budget: approx. 16 mio DKK with additional funding and PhDs
Year 2014-2018
TEACHOUT-studier

Studie 1
Fysisk aktivitet

Studie 2
Læring

Studie 3
Trivsel og sociale relationer

Studie 4
Undervisning og didaktik
<table>
<thead>
<tr>
<th>Input</th>
<th>Activities</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers practise regular EOTC</td>
<td>Education outside the classroom (EOTC)</td>
<td>Proximal</td>
</tr>
<tr>
<td></td>
<td>Pedagogy</td>
<td>Social relations</td>
</tr>
<tr>
<td></td>
<td>Problem solving</td>
<td>Well-being</td>
</tr>
<tr>
<td></td>
<td>Cooperation</td>
<td>Motivation</td>
</tr>
<tr>
<td></td>
<td>Movement</td>
<td>Learning</td>
</tr>
<tr>
<td></td>
<td>Play</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use of bodies and senses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Places</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Natural and cultural settings in local environment</td>
<td></td>
</tr>
<tr>
<td>School children aged 9-13 participate</td>
<td>Physical activity</td>
<td>Distal</td>
</tr>
<tr>
<td></td>
<td>Improved health, well-being and academic achievements for children</td>
<td></td>
</tr>
</tbody>
</table>
Tværsnitsstudier

• Skoleåret 2014-15
• Parallelklassedesign
• 16 skoler med 17 udeskole-klasser og 16 kontrol-klasser
• Cut-point ±150 min udeskole per uge i snit
• Fysisk aktivitet: Accelerometer-malinger mm.
Kvasi-eksperimenter

- Skoleåret 2014-15, 38 uger
- 18 skoler med 27 udeskole-klasser og 17 kontrol-klasser
- Kontrolgruppe: Matchede klasser samt parallelklasser
- Cut-point 2 timer udeskole per uge i snit.
  Ca. 1 time vs. 4,7 timer per uge 1½ gange om ugen.
Project overview & data collection
<table>
<thead>
<tr>
<th>Measure</th>
<th>Instrument</th>
<th>Time of Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>“MG” (mathematical basis skills test) (Hansen 2012)</td>
<td>August 2014 and May 2015</td>
</tr>
<tr>
<td>Pupils’ social relations</td>
<td>Social Network Analysis (Hanneman &amp; Riddle 2005)</td>
<td>August 2014 and May 2015</td>
</tr>
<tr>
<td></td>
<td>Three sub-scales from the Sport Motivations Scale (Wikman et al., 2013)</td>
<td>August 2014 and May 2015</td>
</tr>
<tr>
<td>Pupils’ physical activity levels</td>
<td>AXIVITY accelerometers (AX3)</td>
<td>10 day periods from August 2014 to June 2015</td>
</tr>
<tr>
<td>Pupils’ height, weight and BMI</td>
<td>Leicester Height Measure</td>
<td>At the beginning of the 10 day periods from August 2014 to June 2015</td>
</tr>
<tr>
<td></td>
<td>OMRON BF212 Body Composition Monitor</td>
<td></td>
</tr>
<tr>
<td>Contexts of the PA</td>
<td>Schools’ class time tables</td>
<td>10 day periods from August 2014 to June 2015</td>
</tr>
<tr>
<td></td>
<td>Diary/activity questionnaire by pupils and parents</td>
<td></td>
</tr>
<tr>
<td></td>
<td>School protocols</td>
<td></td>
</tr>
<tr>
<td>Pupils’ background</td>
<td>Electronic Questionnaire</td>
<td>March 2015</td>
</tr>
<tr>
<td>Teachers’ background</td>
<td>Electronic questionnaire</td>
<td>March 2015</td>
</tr>
<tr>
<td>Degree of implementation</td>
<td>Online platform</td>
<td>Throughout the school year</td>
</tr>
</tbody>
</table>
Dose delivered & implementation fidelity

EOtC-classes $n=28$

Non-EOtC Parallel classes $n=20$

Hours of EOtC delivered
Udeskole, TEACHOUT og UaU

• Et livsforløbs-perspektiv (børn og unge)
• Et “settings”-perspektiv (skolen, nærmiljøet og naturen)
• En populationstilgang
• Sundhed og uddannelse (add-in og tværrvidenskab)
• Holistisk og integreret monitorering og evaluering (multiple udfaldsmål og sammenhænge mellem disse)
• Forskning og praksisudvikling
• Evaluering og implementering
Spørgsmål og kommentarer?

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