Health Behavior Change: From Mechanisms to Action

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Overview

1. The role of human behavior in health and well-being
2. From mechanisms to action
   • The principles
   • Two examples: Healthy diet, hand hygiene
3. Conclusions
Learning Outcomes

After this lecture you will be able to…

- describe the role of behavior in health and well-being
- explain the principles of theory-based behavior change
- name a few mechanisms of action to change health behavior
Leading causes of death

Source: WHO Global Health Estimates

https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death
Chronic Disease

Healthcare costs: Switzerland

51.686 Mia. Schweizer Franken

Herz-Kreislauferkrankungen
Muskuloskeletale Krankheiten
Psychische Störungen
Krebs
Chronische Atemwegserkrankungen
Diabetes Demenz
Übrige NCDs

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https://www.obsan.admin.ch/de/indikatoren/MonAMVolkswirtschaftliche-kosten-von-ncds

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Behavior is Key in Health and Well-Being

- > 40% of deaths attributable to personal decisions (Keeney, 2008)
- Protective effect: not smoking, being physically active, moderate alcohol consumption, fruit & vegetable consumption (e.g. Khaw et al., 2008)

THE KEY LIFESTYLE RISKS FOR CHRONIC DISEASE

- Tobacco Use
- Poor Nutrition
- Physical Inactivity
- Excessive Alcohol Use

https://www.cdc.gov/chronicdisease/resources/infographic/chronic-diseases.htm
Dose-response
“If the huge health benefits of these few lifestyle habits were put into a pill, it would be declared a spectacular breakthrough in the field of medicine.“
(Bandura, 2001, p. 16)
Why do some people behave more healthily than others?

https://www.menti.com/yukt9jrcb
How can we change health behavior?

Using common sense

Keinen Velohelm zu tragen, kann Ihre Frisur ruinieren.

What are the health benefits of physical activity?

- Dementia by up to 30%
- All-cause mortality by 30%
- Hip fractures by up to 68%
- Cardiovascular diseases by up to 35%
- Type 2 diabetes by up to 40%
- Depression by up to 30%
- Colon cancer by 30%
- Breast cancer by 20%

How can we change health behavior?
Using psychological science

*Health psychology* is the aggregate of the specific educational, scientific, and professional contributions of the discipline of psychology to the promotion and maintenance of health, the prevention and treatment of illness, and the identification of etiologic and diagnostic correlates of health, illness, and related dysfunction. (Matarazzo, 1980, p. 815)

https://ehps.net/
https://healthpsychology.ch/
From mechanisms to action

Identify > Measure > Change

(Davidson et al., 2020)
From mechanisms to action

Mechanism of action
«the processes through which a behaviour change technique affects behaviour»
(Michie et al., 2018, p. 502)

Hagger et al. (2020, p. 202; based on Hagger, 2019)
From mechanisms to action
Explaining health behavior

Continuum theories

Stage theories

Frameworks

Capability

Motivation

Opportunity

Behaviour

Photo by Lindsay Henwood on Unsplash

Michie et al. (2011)
From mechanisms to action
Explaining health behavior

Health Action Process Approach
(Schwarzer, 2008)
Empirical examples

- Healthy diet: Promoting healthy eating using social support
- Hand hygiene: Optimizing behavior change interventions based on identifying their active ingredients
Promoting healthy eating using social support (Berli et al., 2020; Inauen et al., 2017)

Health Action Process Approach (Schwarzer, 2008)
Can smartphone-based support groups promote healthy eating?

Inauen et al. (2017)
### 2 x 2 Study Design

<table>
<thead>
<tr>
<th>Social Support</th>
<th>Information Only</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal: Increase Fruits &amp; Vegetables</strong></td>
<td><img src="image1.png" alt="WhatsApp" /> <img src="image2.png" alt="Fruits &amp; Vegetables" /></td>
</tr>
<tr>
<td><strong>Goal: Decrease Unhealthy Snacks</strong></td>
<td><img src="image1.png" alt="WhatsApp" /> <img src="image3.png" alt="Unhealthy Snacks" /></td>
</tr>
</tbody>
</table>

Inauen et al., (2017)
Randomization:
- Eating goal
- Support

Support each other
- Standardized daily message, respond supportively

“Hey guys, how's it going for you on the second day? Wishing you lots of success with consuming fewer snacks!”

Inauen et al. (2017)
Intervention effects on healthy eating

Fruits and Vegetables (servings per day)
F&V Goal Group (n = 97)

Unhealthy Snacks (servings per day)
Snack Goal Group (n = 106)

Inauen et al. (2017)
Mechanisms

Indirect effect:
Day 1: $B < -0.01$, $SE = 0.07$, $p = 0.948$
Increase: $B = 0.02$, $SE = 0.01$, $p = 0.033$

Berli et al. (2020)
Empirical examples

• Healthy diet: Promoting healthy eating using social support
• Hand hygiene: Optimizing behavior change interventions based on identifying their active ingredients
Promoting hand hygiene

- 1.8 million diarrhea-related infant deaths in low- and middle-income countries (Walker, 2013)

- Consistent handwashing with soap can reduce diarrhea (Borghi et al., 2002, Curtis et al., 2003, Freeman et al., 2014, Prüss-Ustün et al., 2014)
Which behavioral determinants explain hand washing with soap?

How can we promote hand washing with soap?

Hand washing with soap (food-related and stool-related)

Identify, Measure

Friedrich et al. (2018)

RANAS Approach
(Mosler, 2012)
1) Can an intervention based on the RANAS approach effectively promote food-related and stool-related hand washing?

2) What are the active ingredients of the intervention?
Study Design

Inauen et al. (2020)

$N = 448$ caregivers

$N = 406$ caregivers (91%)

Baseline Survey

No intervention control (5 clusters)

Community + school intervention (5 clusters)

Follow-up Survey

Time

Change

Swiss Agency for Development and Cooperation SDC
Structured behavioral observation

Inauen et al. (2020)
Structured face-to-face interviews

Inauen et al. (2020)
Household Interventions
Prompt building of infrastructure

→ Self-efficacy
→ Remembering

Inauen et al. (2020)
Household Interventions

Experiment & Guided Practice

→ Self-efficacy

→ Affective attitude (disgust)

Inauen et al. (2020)
Household Interventions
Planning task

→ Action planning
→ Remembering
→ Commitment

Inauen et al. (2020)
Household Interventions

Self-Monitoring Calendar

→ Action control

Inauen et al. (2020)
Household Interventions

Public Commitment

→ Descriptive norm
→ Commitment

Inauen et al. (2020)
Behavior Change Effects

**Observed food-related hand washing with soap**

- Baseline: 0.00
- Follow-Up: 0.40

**Observed stool-related hand washing with soap**

- Baseline: 0.00
- Follow-Up: 0.50

- Change: +18% (Control: 0.05, Intervention: 0.18)
- Change: +22% (Control: 0.05, Intervention: 0.16)

Inauen et al. (2020)
Intervention Mechanisms

Active Ingredients of the Intervention

Inauen et al. (2020)
Summary

- Theory-based intervention: 22% improved observed handwashing with soap compared to controls
- Intervention changed psychosocial factors, which was related to observed handwashing
- The mechanism of action was remembering

Inauen et al. (2020)
Identifying active intervention ingredients

Reminders and infrastructure increase remembering
→ Necessary component

Guided practice to increase self-efficacy
→ Less relevant component that might be removed

Inauen et al. (2020)
Empirical examples

• Healthy diet – Sometimes it’s not the mechanism you assumed
• Hand hygiene – Investigating mechanisms allows optimizing interventions

Are behavior change effects lasting?
Behavior change maintenance

- 40% weight regain 1 year after lifestyle interventions (Barté et al., 2010)
- Modest maintenance of physical activity interventions (Amireault et al., 2013; Grimmett et al., 2019; Howlett et al., 2019)
- No lasting effects for sedentary interventions (Howlett et al., 2019)

Mechanisms?
Behavior change maintenance

Mechanisms

- Beliefs about capabilities
  - Motivation and goals

- Beliefs about consequences*
  - Health status

- BMI*
  - Education*

Moderate-to-large

Small-to-moderate

Small/trivial

Physical activity maintenance [14-27%]

- Motives (e.g. satisfaction)
- Self-regulation (e.g. coping with relapse)
- Habits
- Resources (e.g. memory)
- Context (e.g. social support)

Kwasnicka et al. (2016)

Amireault et al. (2013)
Habit

What the general public thinks it is

What science thinks it is

Cue
Habit

Habit intervention promotes behavioral maintenance (Beeken et al., 2017)
COVID-19: The role of habit

The Role of Habit

BECCCS: Behavior Change in Context to Contain the Spread of SARS-CoV-2

Aim

Develop and test a theory- and evidence-based smartphone application to promote infection prevention behavior

https://www.gpv.psy.unibe.ch/forschung/becccs/becccs_interventionsevaluation/index_ger.html

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Multi Phase Optimization Strategy (MOST)
Collins et al. (2014)

I
Intervention development
Based on theory and evidence

II
Intervention optimization
Determine the most effective intervention components

III
Intervention evaluation
Determine effectiveness of the intervention short and long term
Soapp

Promoting habit: Examples

Implementation intentions

Übung 4

Hier siehst du das Beispiel von Laura:

Handlungspläne

- Zuhause ankommen
  - Schuhe ausziehen
- Mantel aufhängen

- Hände waschen
- Hände dezinfizieren

Übung 7

Möchtest du es ausprobieren? Suche dir Bilder (können auch humorvoll sein) und bringe sie dort an, wo sie dich an deinen Handlungsplan erinnern (z.B. bei der Garderobe, in der Küche etc.). Hier siehst du einige Beispiele für geeignete Bilder, die du bei Bedarf gerade herunterladen kannst. Wir senden dir gleich eine Mail mit Links zu diesen Bildern gesendet, damit du sie gleich herunterladen und ausdrucken kannst.
From mechanisms to action

Conclusions & open questions

• Theory-based development and evaluation of interventions → Enables learning

• Are theory-based interventions more effective?
  • not more effective (Dalgetty et al., 2019; Prestwich et al., 2014)
  • more effective / reliable (Bishop et al., 2015; McEwan et al., 2018; Webb et al., 2010)

• Scalability? → Leveraging digital technology, using behavioral science for effective policy design (Wiedemann & Inauen, in prep)
Take Home Messages

• Behavior is key in health and well-being

• Understanding the mechanisms of human behavior leads to more stringent, reliable (and effective) behavior change interventions

• Beyond risk perception: There are many mechanisms of action to change health behavior change
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