Applying Behavior Change Theory to Understanding and Changing Public and Patient Behavior

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Outline of Today’s Lecture

1. Behavioral Theory in Implementation Science

2. Two Behavioral Sciences Theories to start:
   - Health Belief Model
   - Theory of Planned Behavior

3. Combining Across Theories
New Ways to Talk About Evidence Gaps

“Many evidence-based innovations fail to produce results when transferred to communities in the global south, largely because their implementation is untested, unsuitable or incomplete”  T. Madon et al. 2007

What does your evidence-practice gap look like?
The Link Between Translational and Implementation and Dissemination Science

“Implementation science is a relatively young branch of health services research that aims to translate biomedical and public health knowledge into changes in the behavior of health care professionals, patients or the general public.

ImS is concerned with moving from evidence to (changes in) practice and ultimately health outcomes, and in learning how best to do that through research”

What is the Link between Behavior Theory and Improving Evidence-Based Practice?

“Increasing evidence suggests that public health and health promotion interventions based in social and behavioral sciences are more effective than those lacking a theoretical base” – Glanz and Bishop

“Making research more theory-based will improve evidence-based practice” – Green

Glanz K and Bishop D. Annu Rev Public Health. 31:3990418. 2010
Evidence Continuum – Begin with Theory

ImS relevant Design Principles

Design Principle 1: Behavior Change is inherent to translation of evidence into practice, policy, and public health improvements

Design Principle 2: Engagement with stakeholders is essential at all stages

Design Principle 3: The process of change needs to build in iterative cycles and co-directionality in relationships, collaborations, creation of evidence

Gonzales, Handley et al, 2012
What are the roles for use of theory in designing and testing behavior change interventions?

1. Identify the determinants of a behavior so you can understand what to focus on

2. Create a causal model of the problem with detailed components for what could be targeted to change

3. Select intervention methods to match targets

4. Inform evaluation

5. Identify active ingredients and things not needed for change

Bartholomew and Mullen 2011
Which Health Behavior/Change Theories?

1. Psychological theories
2. Inter-personal theories
3. Health communication theories
4. Dissemination of information theories
5. Theories from behavioral economics
6. Participatory, community building, empowerment theories
7. All of the above— and it is ok to combine across them
How Individual-Based Behavior Theories Are Used

1. Provide a road map for answering difficult questions on which behaviors to target and for whom

   e.g. Do you target the providers’ behavior re guidelines or focus on structural or policy barriers? Or both?

2. Help understand environmental factors that reinforce or undermine individual behaviors

   e.g. Neighborhood ‘walkability’, access to condoms, harm reduction for lead poisoning, ease of appointment scheduling

3. Help understand the mechanisms (ingredients) underlying effective interventions – to tailor/scale up

NIH Science of Behavior Change, Meeting Summary, June 15-16, 2009
Practical uses of health behavior theories

Explanatory Theory:
- Descriptive
- Why?
- What can be changed?
- Underlying dynamics?

Change Theory:
- Which strategies?
- Which messages?
- Underlying assumptions?

Targeted Health Behavior or Situation
Practical uses of health behavior theories

Explanatory Theory: Descriptive Why? What can be changed?

Targeted Health Behavior or Situation

Change Theory: Which strategies? Which messages? Underlying assumptions?
An Individual or a Structural/Ecological Perspective?

“High fructose corn syrup made me fat.”

“No, going back for thirds made you fat.”

Wonder what the facts are about high fructose corn syrup? Well, you’re in for a sweet surprise. That’s because it’s natural, nutritionally the same as table sugar and has the same number of calories. And like sugar should be enjoyed in moderation. To learn the facts, please visit our new SweetSurprise.com website.
# A Generalized Ecological Perspective

<table>
<thead>
<tr>
<th>Concept</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td><strong>Intrapersonal Level</strong></td>
<td>Individual characteristics that influence behavior, such as knowledge, attitudes, beliefs, and personality traits</td>
</tr>
<tr>
<td><strong>Interpersonal Level</strong></td>
<td>Interpersonal processes and primary groups, including family, friends, and peers that provide social identity, support, and role definition</td>
</tr>
<tr>
<td><strong>Community Level</strong></td>
<td>Rule, regulations, policies, and informal structures, which may constrain or promote recommended behaviors</td>
</tr>
<tr>
<td>Institutional Factors</td>
<td>Social networks and norms, or standards, which exist as formal or informal among individuals, groups, and organizations</td>
</tr>
<tr>
<td>Public Policy</td>
<td>Local, state, and federal policies and laws that regulate or support healthy actions and practices for disease prevention, early detection, control, and management</td>
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Behavioral Sciences Theory

**Theory** – a set of inter-related concepts, definitions, and propositions that explain or predict events or situations (can also specify relationships among these variables)

**Behavioral Sciences Theory**

an amalgamation of approaches, methods, and strategies/tools from social and health sciences that is accessible to both researchers and practitioners

-- Glanz and Bishop, Ann Rev Public Health 2010

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“It's just a theory, but perhaps it's their opposable thumbs that makes them crazy.”
1. Informed by theory – Framework or constructs identified, but not specifically applied

2. Applied theory - Framework or constructs/domains identified--at least one construct specifically applied

3. Testing theory - Framework or constructs/domains identified and tested against one another

4. Building/creating theory – Developing new or revised theory using constructs specified, measured, and analyzed

“Theoretical Domains” – These occur in some form, with some related terminology, with some degree of emphasis, in just about every change theory dealing with individuals.

1. Risk appraisal
2. Self perception
3. Emotions
4. Relationships & social influences

1. Environment, community, cultural & structural influences

- e.g. PERCEIVED Susceptibility and Perceived CONSEQUENCES
- e.g. SELF-EFFICACY
- e.g. SOCIAL NORMS PEER LEARNING
- e.g. FOOD POLICIES, POVERTY, DIRECT APPT. SCHEDULING, TRANSPORTATION
History of Cognitive Theories-
Health Belief Model
# Health Belief Model

<table>
<thead>
<tr>
<th>Focus:</th>
<th>Key Concepts/Construct</th>
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</table>
| Individuals’ perceptions of the threat posed by a health problem, The benefits of avoiding the threat, and factors influencing the decision to act. Usually related to patients and health behavior within community settings | - Perceived susceptibility  
- Perceived severity  
- Perceived benefits  
- Perceived barriers  
- Cues to action  
- (Self-efficacy) |

Strong Health Beliefs translates into **MOTIVATION** and **ACTION** to prevent, get screened for or control illness.
## Health Belief Model

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<th>CONSTRUCT</th>
<th>DEFINITION</th>
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<tr>
<td>Perceived Susceptibility</td>
<td>Belief about getting a disease or condition</td>
</tr>
<tr>
<td>Perceived Severity</td>
<td>Belief about the seriousness of the condition, or leaving it untreated and its consequences</td>
</tr>
<tr>
<td>Perceived Benefits</td>
<td>Belief about the potential positive aspects of a health action</td>
</tr>
<tr>
<td>Perceived Barriers</td>
<td>Belief about the potential negative aspects of a particular health action</td>
</tr>
<tr>
<td>Cues to Action</td>
<td>Factors which trigger action</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>Belief that one can achieve the behavior required to execute the outcome</td>
</tr>
</tbody>
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Health Belief Model

Modifying Factors

- Age
- Gender
- Ethnicity
- Personality
- Socioeconomics
- Knowledge

Individual Beliefs

- Perceived susceptibility to and severity of disease
- Perceived benefits
- Perceived barriers
- Perceived self-efficacy

Perceived threat

Action

Individual behaviors

Cues to action

Health Belief Model: Intervention Applications

Perceived THREAT: personalize risk, educate on risk

Perceived benefits: operationalize specific actions and benefits

Perceived barriers: reduce negative perceptions, problem-solve, provide incentives

Perceived self-efficacy: support and training, goal setting

INCREASE MOTIVATION ➔ Action
# HBM Example- Understanding/Changing Behavior

<table>
<thead>
<tr>
<th>Concept</th>
<th>Belief</th>
<th>Targets in Prevention Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Susceptibility</td>
<td>“I never heard of that, so it can’t be important”</td>
<td>Educate that everyone could get lead poisoning – possibly use data or show contamination with ‘live’ pottery testing</td>
</tr>
<tr>
<td>2. Perceived Severity</td>
<td>“Look at my baby, there is nothing wrong with him-”</td>
<td>Belief that lead poisoning is bad for you, even if you cannot see its effects - it can be like other poisons such as carbon monoxide. Analogies of slow diseases</td>
</tr>
<tr>
<td>3. Perceived Benefits</td>
<td>“We are so much better off here”</td>
<td>Belief that not getting lead poisoning will improve health, strengthen child’s future.</td>
</tr>
<tr>
<td>4. Perceived Barriers</td>
<td>“saying our food has lead is a criticism of our food culture”</td>
<td>Belief that there was some truth to the lead problem, and that not just a negative stereotype-social marketing for getting tested and hard reduction strategies for pregnant women/kids</td>
</tr>
<tr>
<td>5. Cues to Action</td>
<td>“we did not get tested at home”</td>
<td>Reminder, cues for action – town-specific information at the clinic to promote testing</td>
</tr>
<tr>
<td>6. Self-Efficacy</td>
<td>“I don’t want to seem ungrateful after she made this special meal”</td>
<td>Confident in limiting high risk foods in social circumstances</td>
</tr>
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*Handley et al 2007; 2012*
Theory of Planned Behavior

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<th>Focus:</th>
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</thead>
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<tr>
<td>Individual’s attitude towards a behavior,</td>
<td>Behavioral intention:</td>
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<tr>
<td>perceptions of norms, and beliefs about</td>
<td>- Attitude</td>
</tr>
<tr>
<td>ease of difficulty of changes</td>
<td>- Subjective norm</td>
</tr>
<tr>
<td>Often used in clinician as well as patient</td>
<td>- Perceived control and Self-efficacy</td>
</tr>
<tr>
<td>and community behavior</td>
<td></td>
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</tbody>
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Strong Planned Behavior translates into INTENTION to ACT to prevent, screen for or control illness
Theory of Planned Behavior

**FOCUS ON BELIEFS THAT AFFECT INTENTION**

**MODIFYING FACTORS AND ENVIRONMENT**

- Beliefs, Evaluation of Behavioral Outcomes (combined=ATTITUDES),
- normative beliefs, Motivation (combined=SUBJECTIVE NORM)
- Control beliefs, perceived power (self-efficacy) (combined=PERCEIVED CONTROL)

**INTENTION** ➔ **Action**
Theory of Planned Behavior

APPLICATIONS TO CHANGE FACTORS THAT AFFECT INTENTION

ATTITUDES: Increase exposure to pro-behavior attitudes

SUBJECTIVE: Social marketing to ‘naturalize’ desired behavior

NORM

PERCEIVED CONTROL: Identify behaviors within control, then train and guide, goal setting, reinforce, demonstrate skills

INCREASE INTENTION -> Action
Case Study with TPB Constructs: Logic Model of Behavior Change

Figure 2: Hypothetical logic model of change.
Behavior Change and Rationality

“How am I supposed to think about consequences before they happen?”
What are the roles for use of theory in designing and testing behavior change interventions?

1. Identify the determinants of a behavior so you can understand what to focus on

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Bartholomew and Mullen 2011
How do I find a ‘Perfect Fit’ Theory? Or is there a Menu-Based Approach?

The foundation of any theory-based planning model or intervention is the identification of the behavioral antecedents and the relationship of them to the target behavior.

But it can be challenging to find a way to apply theoretical concepts to specific behaviors and populations and to target multiple aspects of behaviors.

There are several syntheses of evidence-based approaches ... one is called the Behavior Change Wheel, based on Michie et al 2005 work on the Theoretical Domains Framework; 2011 (others include intervention mapping and Integrated Behavioral Model).
# Summary: Theory and Developing Intervention

## Table 1 Steps for developing a theory-informed implementation intervention

<table>
<thead>
<tr>
<th>Step</th>
<th>Tasks</th>
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</table>
| **STEP 1: Who needs to do what, differently?**                      | - Identify the evidence-practice gap  
- Specify the behaviour change needed to reduce the evidence-practice gap  
- Specify the health professional group whose behaviour needs changing |
| **STEP 2: Using a theoretical framework, which barriers and enablers need to be addressed?** | - From the literature, and experience of the development team, select which theory (ies), or theoretical framework(s), are likely to inform the pathways of change  
- Use the chosen theory(ies), or framework, to identify the pathway(s) of change and the possible barriers and enablers to that pathway  
- Use qualitative and/or quantitative methods to identify barriers and enablers to behaviour change |
| **STEP 3: Which intervention components (behaviour change techniques and mode(s) of delivery) could overcome the modifiable barriers and enhance the enablers?** | - Use the chosen theory, or framework, to identify potential behaviour change techniques to overcome the barriers and enhance the enablers  
- Identify evidence to inform the selection of potential behaviour change techniques and modes of delivery  
- Identify what is likely to be feasible, locally relevant, and acceptable and combine identified components into an acceptable intervention that can be delivered |
| **STEP 4: How can behaviour change be measured and understood?**     | - Identify mediators of change to investigate the proposed pathways of change  
- Select appropriate outcome measures  
- Determine feasibility of outcomes to be measured |

Michie et al 2005; 2012
Example of Combining Theoretical Constructs: The Behavior Change Wheel

- Synthesis of 19 behavior change frameworks
  - None were comprehensive
  - Few conceptually coherent
  - Few linked to a general theory of behavior change

- Proposed advantages of BCW
  - Incorporates common features of prior frameworks
  - Identifies concrete and distinct intervention functions to guide design
  - Linked to a behavior change theory that can be applied in any setting

Michie S. Imp Sci 2011
What needs to change? Is greater Capability, Opportunity or Motivation needed?

Michie S. Imp Sci 2011; Michie S. Atkins, West 2014
How to achieve change? What functions are needed? or Motivation needed?
What programs or policies can be used to operationalize these selected functions?