

A Behavioral Approach to Cancer Prevention

Four Models of Behavior Change

- What is a theory? How does it differ from a model?
- How are theories and models developed?
- Why do we have theories and models? What is their value?
- Are these models universal or only related to health behaviors? If they are not universal, what is unique about health that makes it only applicable in this context?
- What are some of assumptions that underlie these theories?

Transtheoretical Model

The Transtheoretical Model of Change (Prochaska & DiClemente, 1983) is a strong developmental and integrative model of behavior. The central organizing construct of the model is the Stages of Change (see diagram). It is a model that focuses on the decision making of the individual as opposed to focusing primarily on social influences on behavior or on biological influences on behavior. The model involves emotions, cognitions, and behavior and relies on self-report.

Stages of Change:

- Precontemplation—no action intended in the foreseeable future (6 months). People in this stage may be uninformed or under-informed about the consequences of their behavior. Or they may have tried to change a number of times and become demoralized about their ability to change. Therefore, not reading or thinking about their present behavior.
- Contemplation--intention to change in the next six months. They are more aware of the pros of changing but are also acutely aware of the cons, often causing ambivalence that can keep people stuck in this stage for long periods of time.
- Preparation---intending to take action in the immediate future, usually measured as the next month. These individuals have a plan of action and should be recruited for action- oriented programs.
- Action-- specific overt modifications in their life-styles have been taken within the past six months. In this model, not all modifications of behavior count as action in this model. People must attain a criterion that scientists and professionals agree is sufficient to reduce risks for disease.
- Maintenance—involves working to prevent relapse.

Regression occurs when individuals revert to an earlier stage, any stage, of change. Relapse is one form of regression, involving regression from Action or Maintenance to an earlier stage.

Health Belief Model

Background

- One of the first theories of health behavior
- From social psychology and public health tradition

Original Model: Overview (see diagram)

- Person's motivation to undertake a health behavior can be divided into 3 main categories:
 - individual perceptions, modifying behaviors, and likelihood of action

Revised Model: Overview (Rosenstock et al., 1988; see diagram)

- Key: added self-efficacy
- 2 major factors in whether person will adopt a health protective behavior:
 - Person must feel personally threatened by the disease (personally susceptible to disease with serious/severe consequences)
 - Must believe benefits of taking preventive action outweigh perceived barriers (and/or costs of) preventive action

HBM in Designing Short- and Long-Term Behavior Change Strategies (see Table)

Comments

- Perceived susceptibility is really the centerpiece of HBM
 - Perceived susceptibility and perceived severity combine to form perceived threat
 - HBM says nothing about how those constructs combine
 - In many studies, researchers look at their additive effect
 - Ask: How perceived threat might relate to perceived benefit?
- Classes of cancer protective behaviors
 - Barriers to screening may be very different for medically based (e.g., mammography) vs. involving self-examination (e.g., BSE; testicular self-exam)

Findings in Studies Testing HBM

- Perceived barriers tend to have strongest association with lack of protective behavior
- Perceived susceptibility typically shows low to moderate positive correlations with protective behavior
- Perceived severity
 - In cancer research: Perceived severity failed to show predictive utility and has not been amenable to change.

Selected Issues

- Level of numeracy in general public
 - In understanding perceived susceptibility, shouldn't we consider general public's competency in understanding and using probability rates?
- Public's understanding of screening tests: detection vs. prevention
- Message framing – its impact on behavior
 - Detection messages
 - tend to be most effective when framed in terms of potential loss (e.g., # of breast cancer deaths associated with failures to be screened) rather than potential gain (e.g., # of breast cancer death averted by regular mammography screening).
 - Health promotion messages (e.g., sunscreen use) tend to be most effective when framed in terms of potential gain rather than potential loss.
- Cultural considerations:
 - Example: Disease threat is a central concept. Need to include cultural concept of disease perception. What is disease? What is illness?

Selected References:

Aiken, L. S., Gerend, M. A., & Jackson, K. M. (2001). Subjective risk and health protective behavior: Cancer screening and cancer prevention. In A. Baum, T. A. Revenson, & J. E. Singer (Eds.), *Handbook of health psychology* (pp. 727-746). Mahwah, NJ: Erlbaum.

Fishbein, M., Triandis, H. C., Kanker, F. H., Becker, M., Middlestadt, S. E., & Eichler, A. (2001). Subjective risk and health protective behavior: Cancer screening and cancer prevention. In A. Baum, T. A. Revenson, & J. E. Singer (Eds.), *Handbook of health psychology* (pp. 3-17). Mahwah, NJ: Erlbaum.

Health Belief Model

Concept	Definition	Potential Change Strategies
Perceived susceptibility	Beliefs about the chances of getting a condition	<ul style="list-style-type: none"> • Define what population(s) are at risk and their levels of risk • Tailor risk information based on an individuals' characteristics or behaviors • Help the individual develop an accurate perception of his or her own risk
Perceived severity	Beliefs about the seriousness of a condition and its consequences	<ul style="list-style-type: none"> • Specify the consequences of a condition and recommended action
Perceived benefits	Beliefs about the effectiveness of taking action to reduce risk or seriousness	<ul style="list-style-type: none"> • Explain how, where, and when to take action and what the potential positive results will be
Perceived barriers	Beliefs about the material and psychological costs of taking action	<ul style="list-style-type: none"> • Offer reassurance, incentives, and assistance; correct misinformation
Cues to action	Factors that activate "readiness to change"	<ul style="list-style-type: none"> • Provide "how to" information, promote awareness, and employ reminder systems
Self-efficacy	Confidence in one's ability to take action	<ul style="list-style-type: none"> • Provide training and guidance in performing action • Use progressive goal setting • Give verbal reinforcement • Demonstrate desired behaviors.

Source: National Cancer Institute. (2005). *Theory at a glance: A guide for health promotion practice* (2nd ed.). (NIH Publication 05-3896). Washington, DC: U.S. Department of Hhealth and Human Services.
<http://www.nci.nih.gov/theory/pdf>

Theory of Planned Behavior

Background

- Developed by social psychologists
- Theory of Planned Behavior is a revision to Theory of Reasoned Action.
 - Key change: Addition of construct of perceived behavior control

Overview

- Behavioral intention is the most important determinant of behavior
- Behavior is determined by strength of person's intention to perform that behavior and amount of actual control the person has over performing the behavior
- Strength of person's intention is determined by 3 factors:
 - Attitude toward the specific behavior – overall evaluation of performing it
 - Do you see the behavior as good, neutral, or bad?
 - Subjective norm regarding the action – extent think important others would want them to perform it
 - Perceived behavioral control – perceptions of ability to perform the behavior [essentially the same as self-efficacy]
- Attitude toward the behavior is determined by:
 - The total set of accessible or salient behavioral beliefs about the personal consequences of performing the behavior
- Subjective norm is determined by:
 - The total set of accessible normative beliefs – beliefs about the viewpoints of others about the behavior
- Perceived behavioral control is determined by:
 - Accessible or control beliefs – beliefs about the presences of factors that may facilitate or impede performance of the behavior
- Theory: Changing behavior requires changing underlying beliefs and/or actual behavioral control

Comments

- Presumes that all other factors (e.g., culture, personality characteristics, the environment) operate through the model's constructs.
- The relative importance of attitude, subjective norm, and perceived behavioral control is likely to vary across behaviors and across populations/cultures
- Direct path from actual behavioral control → behavior, is causally unclear

Behavioral Interventions Based on TPB

- Formative research – 2 stages: elicit and measure accessible beliefs
- Develop and pretest an intervention
- Target the intervention
 - Look at mean levels on the predictor variables
 - If room for change in 2 or 3 predictors, look at relative weights of the predictors. Target the one with strongest predictive weight.
 - Caution: If variability in a predictor is low, it won't be highly correlated with intention or behavior.
 - Probably reasonable to target any of the 3 major predictors of intention, as long as there is room for change.

Findings in Studies Testing TPB

- Meta-analyses (not specific to cancer prevention) suggest predictors account of 35-50% of variance in intention and 26-35% of variance in behavior.

Selected Issues

- Is TPB too “rational”? [Could ask similar question of HBM]

Selected References:

Sutton, S. (2004). Determinants of health-related behaviors: Theoretical and methodological issues. In S. Sutton, A. Baum, & M. Johnston (Eds.). *The Sage handbook of health psychology* (pp. 94-126). London: Sage

Construct Definitions: (see Ajzen's website)

- Behavioral beliefs—subjective probability that the behavior will produce a given outcome
- Attitude toward the behavior—degree to which performance of the behavior is positively or negatively valued
- Normative beliefs—perceived behavioral expectations of important referent individuals/groups (e.g., spouse, family, friends; ... perhaps teacher, doctor, supervisor, coworkers)
- Subjective norms—perceived social pressure to engage or not to engage in a behavior
- Control beliefs—relates to the perceived presence of factors that may facilitate or impede performance of a behavior
- Perceived behavioral control—people's perceptions of their ability to perform a given behavior
- Intention—person's readiness to perform a given behavior; is considered to be the immediate antecedent of behavior
- Behavior—the manifest, observable response in a given situation with respect to a given target
- Actual behavioral control—extent to which a person has the skills, resources, and other prerequisites needed to perform a given behavior

Bandura's Social Learning Theory

A. Overview of Model

1. **Knowledge of health risks and benefits** is a precursor for change—if individuals lack knowledge about the effects of the lifestyle habits, there is no motivation for change.
2. **Belief of personal efficacy** is central to change. It is the foundation for action. Unless one believes that he/she can change, no action will be taken.
3. **We are also affected by the outcomes we expect our action to produce.** Three types of outcomes: a) Physical--pleasurable and adverse outcomes effects of the behavior, including the material benefits and losses; b) social reactions the behavior elicits from others (approval and disapproval); and positive & negative self-evaluation reactions to one's health behavior and status. We adopt behaviors that give us satisfaction.
4. **Personal goals provide further incentive.** Whereas long-term goals set a course, there are too many distractions along the way. Short-term attainable goals encourage action.
5. **Perceived facilitators and obstacles affect the attainment of positive health.** Some come from within, others are external.

B. Several Important Points

1. **Importance of Self-efficacy**---Higher SE → higher goals, less influenced by obstacles and roadblocks
2. Factors in the different health models are really different types of outcome expectations
 - In HBM, severity and susceptibility to disease are perceived negative outcomes; perceived benefits are positive outcome expectations.
 - In theory of reasoned action and planned behavior, it is said that attitude toward behavior and social norms produce intentions that determine behavior. According to Bandura,
 - attitude is measured by perceived outcomes and value placed on these outcomes. These are really outcome expectations.
 - Norms are social outcomes for a given behavior.
 - Intentions are proximal goals.
 - Perceived control overlaps with perceived self-efficacy.

Conclusions and Recommendations (Sutton, 2004)

- There are too many theories of health behavior
 - For sake of parsimony, general theories are preferable to health-specific or domain-specific.
 - Should discourage common practice of “picking and mixing” components of several different theories (what Bandura, 1998, calls “cafeteria style research”).
- Need more standardized measures
 - See NCI’s project, “Theories Project: Improving Theories of Health Behavior”
- Need more studies testing social cognition models using within-individual designs with repeated measures on multiple occasions
- Conduct studies with randomized experiments in which explanatory variables are manipulated – analyze at within-individual and between-individual levels.