Behavior change model | analysis

Introduction

The transtheoretical model posits that health behavior change involves progress through six stages of change: precontemplation, contemplation, preparation, action, maintenance, and termination. Ten processes of change have been identified for producing progress along with decisional balance, self-efficacy, and temptations.

Basic research has generated a rule of thumb for at-risk populations: 40% in precontemplation, 40% in contemplation, and 20% in preparation. Across 12 health behaviors, consistent patterns have been found between the pros and cons of changing and the stages of change. Applied research has demonstrated dramatic improvements in recruitment, retention, and progress using stage-matched interventions and proactive recruitment procedures.

The most promising outcomes to data have been found with computer-based individualized and interactive interventions. The most promising enhancement to the computer-based programs are personalized counselors. One of the most striking results to date for stage-matched programs is the similarity between participants reactively recruited who reached us for help and those proactively recruited who we reached out to help.

If results with stage-matched interventions continue to be replicated, health promotion programs will be able to produce unprecedented impacts on entire at-risk populations.

The paper will discuss at length the various stages of the model, the limitations of the model that affect the way it is implemented practically by medical practitioners and end with concluding remarks about the relative effectiveness of the data.

Development of the Model

This is an overview of the Transtheoretical Model of Change, a theoretical model of behavior change, which has been the basis for developing effective interventions to promote health behavior change. The Transtheoretical Model (Prochaska & DiClemente, 1983; Prochaska, DiClemente, & Norcross, 1992; Prochaska & Velicer, 1997) is an integrative model of behavior change.

The Transtheoretical model is currently conceptualized in terms of several major dimensions. The core constructs, around which the other dimensions are organized, is the stages of change. These represent ordered categories along a continuum of motivational readiness to change a problem behavior. Transitions between the stages of change are effected by a set of independent variables known as the processes of change.

The model also incorporates a series of intervening or outcome variables. These include decisional balance (the pros and cons of change), self-efficacy (confidence in the ability to change across problem situations), situational temptations to engage in the problem behavior, and behaviors which are specific to the problem area.

Also included among these intermediate or dependent variables would be any other psychological, environmental, cultural, socioeconomic,

physiological, biochemical, or even genetic variables or behavior specific to the problem being studied.

Key constructs from other theories are integrated. The model describes how people modify a problem behavior or acquire a positive behavior. The central organizing construct of the model is the Stages of Change.

The model also includes a series of independent variables, the Processes of Change, and a series of outcome measures, including the Decisional Balance and the Temptation scales. The Processes of Change are ten cognitive and behavior activities that facilitate change.

The Transtheoretical Model is a model of intentional change. It is a model that focuses on the decision making of the individual. Other approaches to health promotion have focused primarily on social influences on behavior or on biological influences on behavior.

Discussion

The stage construct is the key organizing construct of the model. It is important in part because it represents a temporal dimension. Change implies phenomena occurring over time. However, this aspect was largely ignored by alternative theories of change. Behavior change was often construed as an event, such as quitting smoking, drinking, or over-eating. The Transtheoretical Model construes change as a process involving progress through a series of five stages.

Precontemplation, the first stage, is the stage in which people are not intending to take action in the foreseeable future, usually measured as the

next six months. People may be at this stage because they are 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. Both groups tend to avoid reading, talking or thinking about their high risk behaviors. They are often characterized in other theories as resistant or unmotivated or as not ready for health promotion programs.

The fact is traditional health promotion programs are often not designed for such individuals and are not matched to their needs.

Contemplation, the second stage, is the stage in which people are intending to change in the next six months. They are more aware of the pros of changing but are also acutely aware of the cons.

This balance between the costs and benefits of changing can produce profound ambivalence that can keep people stuck in this stage for long periods of time. This can often be characterized by phenomenon such as chronic contemplation or behavioral procrastination. These people are also not ready for traditional action oriented programs.

Preparation, the third stage of the model, is the stage in which people are intending to take action in the immediate future, usually measured as the next month. They have typically taken some significant action in the past year.

These individuals have a plan of action, such as joining a health education class, consulting a counselor, talking to their physician, buying a self-help

book or relying on a self-change approach. These are the people that should be recruited for action- oriented smoking cessation, weight loss, or exercise programs.

Action, the fourth and considered by many to be the most important stage in which people have made specific overt modifications in their life-styles within the past six months. Since action is observable, behavior change often has been equated with action. But in the Transtheoretical Model, Action is only one of five stages.

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. In smoking, for example, the field used to count reduction in the number of cigarettes as action, or switching to low tar and nicotine cigarettes.

Now the consensus is clear–only total abstinence counts. In the diet area, there is some consensus that less than 30% of calories should be consumed from fat. The Action stage is also the stage where vigilance against relapse is critical.

Maintenance, the fifth and final stage is the stage in which people are working to prevent relapse but they do not apply change processes as frequently as do people in action. They are less tempted to relapse and increasingly more confident that they can continue their change.

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

Maintenance to an earlier stage. However, people can regress from any stage to an earlier stage. The bad news is that relapse tends to be the rule when action is taken for most health behavior problems. The good news is that for smoking and exercise only about 15% of people regress all the way to the Precontemplation stage. The vast majority regress to Contemplating or Preparation.

In a recent study (Velicer, Fava, Prochaska, Abrams, Emmons, & Pierce, 1995), it was demonstrated that the distribution of smokers across the first three Stages of Change was approximately identical across three large representative samples. Approximately 40% of the smokers were in the Precontemplation stage, 40% were in the Contemplation stage, and 20% were in the Preparation stage.

However, the distributions may be different in different countries. A recent paper (Etter, Perneger, & Ronchi, 1997) summarized the stage distributions from four recent samples from different countries in Europe (one each from Spain and the Netherlands, and two from Switzerland).

The distributions were very similar across the European samples but very different from the American samples. In the European samples, approximately 70% of the smokers were in the Precontemplation stage, 20% were in the Contemplation stage, and 10% were in the Preparation stage.

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The Decisional Balance construct reflects the individual's relative weighing of the pros and cons of changing. It is derived from the Janis and Mann's model of decision making (Janis and Mann, 1985) that included four categories of pros (instrumental gains for self and others and approval for self and others).

The four categories of cons were instrumental costs to self and others and disapproval from self and others. However, an empirical test of the model resulted in a much simpler structure. Only two factors, the Pros and Cons, were found (Velicer, DiClemente, Prochaska, & Brandenberg, 1985). In a long series of studies (Prochaska, et al. 1994), this much simpler structure has always been found.

The Decisional Balance scale involves weighting the importance of the Pros and Cons. A predictable pattern has been observed of how the Pros and Cons relate to the stages of change. Figure 2 illustrates this pattern for smoking cessation. In Precontemplation, the Pros of smoking far outweigh the Cons of smoking. In Contemplation, these two scales are more equal. In the advanced stages, the Cons outweigh the Pros.

A different pattern has been observed for the acquisition of healthy behaviors. The patterns are similar across the first three stages. However, for the last two stages, the Pros of exercising remain high. This probably reflects the fact that maintaining a program of regular exercise requires a

continual series of decisions while smoking eventually becomes irrelevant. These two scales capture some of the cognitive changes that are required for progress in the early stages of change.

The Self-efficacy construct represents the situation specific confidence that people have that they can cope with high-risk situations without relapsing to their unhealthy or high-risk habit. This construct was adapted from Bandura's self-efficacy theory (Bandura, 1977, 1982). This construct is represented either by a Temptation measure or a Self-efficacy construct.

The Situational Temptation Measure (DiClemente, 1981, 1986; Velicer, DiClemente, Rossi, & Prochaska, 1990) reflects the intensity of urges to engage in a specific behavior when in the midst of difficult situations. It is, in effect, the converse of self-efficacy and the same set of items can be used to measure both, using different response formats. The Situational Self-efficacy Measure reflects the confidence of the individual not to engage in a specific behavior across a series of difficult situations.

Self-efficacy can be represented by a monotonically increasing function across the five stages. The temptation is represented by a monotonically decreasing function across the five stages.

Processes of Change are the covert and overt activities that people use to progress through the stages. Processes of change provide important guides for intervention programs since the processes are the independent variables that people need to apply or be engaged in, to move from stage to stage.

Ten processes (Prochaska & DiClemente, 1983; Prochaska, Velicer, DiClemente, & Fava, 1988) have received the most empirical support in our research to date. The first five are classified as Experiential Processes and are used primarily for the early stage transitions. The last five are labeled Behavioral Processes and are used primarily for later stage transitions.

Consciousness Raising involves increased awareness about the causes, consequences, and cures for a particular problem behavior. Interventions that can increase awareness include feedback, education, confrontation, interpretation, bibliotherapy, and media campaigns.

Dramatic Relief initially produces increased emotional experiences followed by reduced effect if appropriate action can be taken. Psychodrama, role playing, grieving, personal testimonies and media campaigns are examples of techniques that can move people emotionally.

Environmental Reevaluation combines both affective and cognitive assessments of how the presence or absence of a personal habit affects one's social environment such as the effect of smoking on others. It can also include the awareness that one can serve as a positive or negative role model for others. Empathy training, documentaries, and family interventions can lead to such re-assessments.

Social Liberation requires an increase in social opportunities or alternatives especially for people who are relatively deprived or oppressed. Advocacy, empowerment procedures, and appropriate policies can produce increased opportunities for minority health promotion, gay health promotion, and health promotion for impoverished people. These same procedures can also

be used to help all people change such as smoke-free zones, salad bars in school lunches, and easy access to condoms and other contraceptives.

Self-reevaluation combines both cognitive and affective assessments of one's self-image with and without a particular unhealthy habit, such as one's image as a couch potato or an active person. Value clarification, healthy role models, and imagery are techniques that can move people evaluatively.

Stimulus Control removes cues for unhealthy habits and adds prompts for healthier alternatives. Avoidance, environmental re-engineering, and self-help groups can provide stimuli that support change and reduce risks for relapse. Planning parking lots with a two-minute walk to the office and putting art displays in stairwells are examples of reengineering that can encourage more exercise.

Helping Relationships combine caring, trust, openness and acceptance as well as support for the healthy behavior change. Rapport building, a therapeutic alliance, counselor calls and buddy systems can be sources of social support.

Counter Conditioning requires the learning of healthier behaviors that can substitute for problem behaviors. Relaxation can counter stress; assertion can counter peer pressure; nicotine replacement can substitute for cigarettes, and fat free foods can be safer substitutes.

Reinforcement Management provides consequences for taking steps in a particular direction. While reinforcement management can include the use of punishments, we found that self-changers rely on rewards much more than

punishments. So reinforcements are emphasized, since a philosophy of the stage model is to work in harmony with how people change naturally. Contingency contracts, overt and covert reinforcements, positive self-statements and group recognition are procedures for increasing reinforcement and the probability that healthier responses will be repeated.

Self-liberation is both the belief that one can change and the commitment and recommitment to act on that belief. New Year's resolutions, public testimonies, and multiple rather than single choices can enhance self-liberation or what the public calls willpower. Motivation research indicates that people with two choices have greater commitment than people with one choice; those with three choices have even greater commitment; four choices does not further enhance will power. So with smokers, for example, three excellent action choices they can be given are cold turkey, nicotine fading and nicotine replacement.

Application to practice

This section discusses how the Transtheoretical model can be used effectively in helping people overcome problems like helping smokers to stop smoking. The model has previously been applied to a wide variety of problem behaviors. These include smoking cessation, exercise, low fat diet, radon testing, alcohol abuse, weight control, condom use for HIV protection, organizational change, use of sunscreens to prevent skin cancer, drug abuse, medical compliance, mammography screening, and stress management.

The model has proved to be especially effective in helping pregnant women who are chain smokers by making them realize that their smoking habit may cause irreparable damage to the fetus.

For smoking, an example of social influences would be peer influence models (Flay, 1985) or policy changes (Velicer, Laforge, Levesque, & Fava, 1994). An example of biological influences would be nicotine regulation models (Leventhal & Cleary, 1980; Velicer, Redding, Richmond, Greeley, & Swift, 1992) and replacement therapy (Fiore. Smith, Jorenby, & Baker, 1994). Within the context of the Transtheoretical Model, these are viewed as external influences, impacting through the individual.

Though the prevalence of cigarette smoking has declined it still remains the leading cause of premature death from chronic disease. In the prevention of tobacco associated disease the promotion of smoking cessation is a key strategy.

Tailored communications are one of the most promising approaches to smoking cessation interventions for entire populations. Assessments based on the Transtheoretical Model are processed by computer-based expert systems that generate feedback reports tailored to each individual to accelerate their progress through the stages of change for smoking cessation.

A series of three tailored communications was found to produce long-term point prevalence abstinence rates within the narrow range of 22-26% abstinence. This same range of abstinence was found even when two or

three other behaviours (e. g. diet and sun protection) were treated in the population.

These results point to a future in which health behaviour risk interventions will be assessed not solely by their efficacy but by their population impact.

The model involves emotions, cognitions, and behavior. This involves a reliance on self-report. For example, in smoking cessation, self-report has been demonstrated to be very accurate (Velicer, Prochaska, Rossi, & Snow 1992).

Accurate measurement requires a series of unambiguous items that the individual can respond to accurately with little opportunity for distortion. Measurement issues are very important and one of the critical steps for the application of the model involves the development of short, reliable, and valid measures of the key constructs.

This model combines elements of theories used in psychotherapy and behavior modification. In the model are five stages (precontemplation, contemplation, preparation, action, and maintenance) that describe when behavior change occurs. To be most effective, a health care provider's interventions should match the patient's stage of change. The model also includes 10 cognitive and behavioral processes that describe how change occurs while a person is moving among the stages. The processes (social liberation, dramatic relief, helping relationships, consciousness-raising, environmental reevaluation, reinforcement management, self-reevaluation, stimulus control, counterconditioning, and self-liberation) define change in terms of the coping strategies used. Before intervening, the pharmacist

needs to ask questions about the patient's behavior that will identify the stage.

If smokers in the precontemplation stage are receiving medications for chronic diseases, pharmacists can make them aware of the negative effects of smoking on their specific conditions. People in the contemplation stage are open to education about smoking and health, and those in the preparation stage are ready to set goals and choose methods for cessation.

Smokers in the action stage are attempting to quit. Pharmacists can offer support, reinforcement, and guidance to people in the action and maintenance stages. Pharmacists can use the transtheoretical model to categorize patients by their stage of change and then devise and deliver appropriate and individualized interventions.

While extensive research has examined the first five stages of change for the acquisition and adherence to exercise behavior (e. g., Cardinal, 1997; Marcus et al, 1992; Nigg & Courneya, 1998), research investigating the validity of the termination stage for exercise is limited and equivocal (Cardinal, 1999; Cardinal & Levy, 2000; Courneya & Bobick, 2000).

Furthermore, research examining the TTM for exercise has been criticized because the majority of researchers have not investigated all five of the TTM constructs simultaneously (Culos-Reed, Gyurcsik, & Brawley, 2001). Consistent with this criticism, no studies examining the termination stage have used all five of the TTM constructs. As a result, it is difficult for researchers to develop accurate and consistent knowledge of how the psychosocial constructs of the TTM effect exercise behavior. Thus, research

examining the relationship between all the TTM constructs with the termination stage is warranted.

Conclusion

Many of today′s health problems are due in part to long-standing behavioral patterns. Patterns of eating, physical activity, tobacco and alcohol use contribute to health problems such as diabetes, hypertension, heart disease, stroke and cancer. An understanding of the factors that permit individual change in health behaviors is critical to developing new treatments and interventions that can prevent and ameliorate chronic disease conditions resulting from lifestyle choices.

Behaviour change is probably the most difficult form of ' inside-out' change. The Transtheoretical Model of Change has shown itself to be the most effective intervention in securing real and lasting change in behaviour.

Surprisingly, it is little understood or practiced outside the health field. People are coached into modify a problem behaviour or acquire a positive one. For example, when helping people stop smoking or lose weight.

The five stages of change focus on choice or decision-making. The model relies on the leadership for real change coming from individuals or teams with help from an external Change Coach.

Should suggestive evidence be obtained, this information could be used to design a new set of intervention studies that are based on a more precise understanding of how people′s expectations and perceived satisfaction affect the behavioral decisions they make. These studies would focus on specifying

the most effective way to design interventions such that they are able to maximize people′s expectations about the benefits of behavior change without undermining their subsequent satisfaction with the outcomes afforded by behavior change.

The Transtheoretical Model does explicitly distinguish between people in the action and maintenance stages of the behavior change process, but the basis for this classification rests on a somewhat arbitrary distinction in the length of time that a behavior has been adopted (Weinstein et al., 1998). Moreover, the set of cognitive and behavioral strategies that are thought to facilitate initial action are similarly predicted to help them sustain that action over time (Prochaska et al., 1992; Prochaska and Velicer, 1997.