

**Intentions are not Sufficient to Change Behavior:
Strategies that Promote Behavior Change and Healthy Weight Management**
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Abstract

Intentions are what individuals desire to do, yet intentions do not predict future behavior well. Moreover, knowledge of the benefits or risks of engaging in particular health-related behaviors does not typically lead to behavior change. This is true across a wide range of health behaviors but is particularly evident in the treatment of obesity.

Individuals who initiate a weight loss program have the intention to lose weight and keep it off, yet only a small percentage of individuals achieve this goal. Although physiological changes following weight loss increase the difficulty of maintaining lost weight, numerous studies have shown that individuals who continue adhering to recommended eating and exercise behaviors maintain their initial weight loss. This suggests that sustained behavior change, rather than physiological changes following weight loss, is the primary determinant of whether an individual will maintain weight loss over the long-term. Data obtained from the National Weight Control Registry further support this contention, as the vast majority of individuals on this registry report engaging in similar eating and physical activity behaviors. Given that behavioral intentions and increased knowledge are only weak determinants of behavior change, there is a need to improve our understanding of the factors that influence long-term behavior change. The need to understand factors that influence eating and exercise behaviors has never been greater given that the prevalence of obesity has increased dramatically over the past three decades, making the current rates of obesity at an all time high both within the U.S. and worldwide. In this chapter, we review the psychological and behavioral factors that have been associated with long-term behavior change and subsequent weight

loss maintenance, as well as discuss ways to improve future interventions to achieve the goal of long-term weight loss.

I. Introduction

Despite increasing evidence of the negative health consequences of being overweight, the obesity epidemic continues to increase in the United States (National Task Force on the Prevention and Treatment of Obesity, 2000). Studies indicate that most overweight individuals desire to lose weight and report engaging in a weight loss practice (e.g., low calorie diet; Horm & Anderson, 1993); thus, the increasing obesity epidemic does not appear to be due to a lack of desire or intention for weight loss. Although many overweight individuals can achieve significant weight losses of 10 kg or more over short time periods (i.e., < 6 months), very few are able to sustain their initial weight loss over the long-term (i.e., two or more years; Perri, Foreyt, & Anton, 2007). Given this situation, a logical question to ask is what factors keep individuals who have the intention to lose weight from adhering to healthy lifestyle changes (e.g., reduced calorie diet and increased physical activity) necessary to achieve successful long-term weight loss. In order to properly address this question, we need a better understanding of behavioral intentions and other factors that influence health behaviors, such as dietary intake and physical activity. This need has never been greater, given the increasing prevalence of obesity throughout the world.

A behavioral intention may be defined as one's dedication or sense of obligation to act (Fishbein, Ajzen, & McArdle, 1980). According to the theory of reasoned action and theory of planned behavior, intentions are a three-fold product of: the belief or attitude that the behavior will result in positive outcomes; response towards others' expectations of their behaviors, commonly referred to as subjective norms; and the perceived control of having the resources and opportunities to change one's behavior

(Ajzen, 1985). In support of this theory, behavioral intentions have been found to be significantly impacted by positive change in attitude, subjective norms, and a higher perception of behavioral control (Fife-Schaw, Sheeran, & Norman 2007; Kosma et al., 2007; Blue 2007; Rhodes, Macdonald, & McKay, 2006). Intention thus becomes a mediator between one's attitudes and behavior.

As long as conflicting habits have not been formed, behavioral intent often predicts short-term behavior change and/or future action (i.e., < 1 month; Maddux & DuCharme, 1997; Neal, Wood, & Quinn, 2006). Behavioral intent, however, is not a strong predictor of future behavior over long time periods (i.e., > 1 year; Mullen, Hersey, & Iverson, 1987). The lack of a strong relationship between behavioral intentions and long-term behavior change has been found across multiple behavioral domains and is particularly applicable to weight management. For example, studies have found successful short-term weight loss is linked to intention to change behavior, but behavioral intentions do not independently predict long-term change in healthy eating and exercise behavior (Scholz et al., 2007).

An important distinction must be made between intention and habit; whereas an intention is a conscious decision to act, a habit is a behavioral disposition formed after repeated past actions (Neal, Wood, & Quinn, 2006). Habits and intentions are separate and independent predictors of behavior; whereas intentions are formed through decisions based on available information, habits are formed based on repeated responses to the supporting context or environment (Neal, Wood, & Quinn, 2006) including such external circumstances as time of day, mood, environment, and goals (Bargh & Chartrand, 1999). Habits are formed out of automaticity toward action that are prompted below conscious

awareness (Bargh & Chartrand, 1999); thus it is difficult for a conscious intention to break a habit, particularly since thought processes also occur automatically. Habits are continued in spite of conflicting intentions, and one's self-motivation and ability are often incapable of overriding habits. For example, a simple decision making task has been found to deplete self-regulation (Baumeister, Muraven & Tice, 2000), revealing that distractions can quickly dominate intention and return one to habitual acts. For these reasons, many individuals have difficulty changing a habit pattern, even if it is no longer effective or satisfying.

In order to better understand the etiology and maintenance of health behavior change, it may be helpful to adopt theory driven approaches, which attempt to describe the complex interactions of factors from multiple domains that contribute to an individual's habitual behavior pattern. Fortunately, numerous psychological models, which are briefly reviewed below, have been put forth that can aid in our understanding of health behavior change.

II. Theories of Behavior Change

Health Belief Model

The Health Belief Model (HBM; Rosenstock, 1974) proposes that initiation and maintenance of a health behavior change depends on a number of illness-related factors, such as perceived susceptibility and perceived severity, and behavior change factors, such as the costs and benefits of adopting a new health behavior. Perceived susceptibility represents an individual's perception of his or her risk of contracting a particular condition, whereas perceived severity relates to a person's beliefs and feelings regarding the seriousness of a potential threat or illness. Higher perceptions of severity or

seriousness are thought to increase the likelihood of behavior change (Clark & Becker, 1998), and perceived susceptibility has been associated with healthy behavior change (Spector, 2007). Perceived benefits represent an individual's belief in the effectiveness of various actions to reduce the disease threat, with greater perceived benefits also associated with positive behavior change (Dishman et al., 1985; Neuberger et al., 1994). In contrast, perceived barriers relate to the negative aspects or costs of taking a particular health action and can serve as an impediment to adopting the recommended behavior (Owen & Bauman, 1992; King et al., 1997). The HBM has received considerable research attention, and there is a large body of evidence in support of the HBM's ability to explain preventive health actions. In a review by Janz and Becker (1984), each HBM dimension was found to be significantly associated with change in health behavior, with perceived barriers receiving the most consistent support.

Social-Cognitive Model

The Social-Cognitive Model (Bandura, 1997) attempts to explain how complex interactions of personal, behavioral, and environmental factors and conditions may contribute to or interfere with the adoption of health promoting behaviors, such as regular physical activity. Furthermore, social-cognitive theory highlights an individual's ability to regulate his or her own behavior by setting goals, monitoring progress towards these goals, and actively intervening to make his or her social and/or physical environments supportive of these goals. Thus, the social-cognitive approach recognizes the reciprocal influences between environmental and personal factors.

Within the social-cognitive framework, self-efficacy is hypothesized to be the critical mediator in determining which behaviors are attempted and how much effort is put forth

in carrying out a desired behavior. Indeed, self-efficacy is the construct that has received the most consistent support in the in being related to dietary and physical activity change (Bennett et al., 1999; Bungum et al., 1999; Chen et al., 1999). Outcome expectancies, or beliefs that a behavior will lead to a desired outcome, have also been proposed to influence the amount of effort individuals put forth when making behavior changes.

Theory of Planned Behavior

The Theory of Planned Behavior (Ajzen, 1985) proposes that intention to perform a behavior can be accounted for by attitudes about an action, perceptions of social norms, and the degree of control a person has over his or her behavior. The relative influence of each of these components may vary individually, as well as by the behavior undergoing change (Clark & Becker, 1998). As with the HBM, sociodemographic factors are thought to influence exercise participation solely through their influences on the determinants of behavioral intention, which is viewed as the direct mediator of behavior.

In a recent review (Godin & Kok, 1996), this theory was found to be very useful in predicting behavioral intentions, which, as noted above, are generally good predictors of short-term (< 1 month) but not long-term behavior change (Maddux & DuCharme, 1997). Furthermore, positive attitude, or the belief that a specific behavior will lead to a desired outcome, has generally been associated with better adherence to health regimens (Godin & Shephard, 1985; Godin, Valois, & Lepage, 1993). Health locus of control has also predicted adherence with supervised exercise programs in cardiac patients (Oldridge & Streiner, 1990) and other adult populations (Sallis et al., 1989).

Transtheoretical Model

The Transtheoretical Model (Prochaska & DiClemente, 1986) proposes that individuals move through five major stages of change when adopting new health behaviors. The first stage, precontemplation, includes individuals who are not engaging in the desired health behavior (e.g., physical activity). People in the second stage, contemplation, are not participating in physical activity, but intend to start in the near future (i.e., six months). Individuals in the third stage, preparation, are actively making changes to incorporate regular physical activity into their lifestyle. The fourth stage, action, includes people who have regularly participated in physical activity for less than six months, whereas individuals in the fifth stage, maintenance, have participated in regular physical activity for six months or longer (Marcus, Rossi, Selby, Niaura, & Abrams, 1992).

In addition to stage of change, the Transtheoretical Model incorporates other important constructs, such as decisional balance (Marcus, Rakowski, & Rossi, 1992), self-efficacy (Marcus, Selby, Niaura, & Rossi, 1992), and processes of behavior change (Marcus et al., 1992). Decisional balance represents the relative value attached to the “pros” and “cons” associated with making a significant behavior change, with a favorable balance of “pros” to “cons” increasing the likelihood of behavior change. In contrast, self-efficacy represents an individual’s confidence in his or her ability to carry out a desired behavior.

Toward An Integrated Model

The strong similarities among the various health behavior models and theories suggest that they may not be distinct models but rather different representations of the same basic concepts (Maddux & DuCharme, 1997). In other words, the models may

differ more in the nomenclature used to describe various characteristics than in their actual conceptual underpinnings, as there appears to be a high degree of overlap in the major features of the relevant models. For example, perceived behavioral control in the theory of planned behavior is highly similar to self-efficacy, a construct that has been incorporated in numerous models (Courneya, 1995). As described above, each of the four behavior change models view behavior as being influenced by multiple factors that likely interact with each other. In particular, social cognitive theory views an individual's behavior as being influenced by his or her previous behavior, cognitions, and other personal factors (Bandura, 1986), and these determinants are theorized to influence each other bi-directionally.

III. Factors that Impact Adherence

In line with social cognitive theory, we propose a cyclical model in which thoughts, emotions, and behavior simultaneously influence each other. As noted above, both thought processes and behavior can occur automatically and develop into habit patterns. Thus, this cycle can be adaptive or maladaptive. In an adaptive cycle, the individual engages in healthy thinking patterns, which contribute to healthy emotional states and behavioral patterns. If this cycle is not interrupted, these states tend to maintain each other. In a maladaptive cycle, however, negative thoughts may lead to negative emotions, which may reduce motivation to engage in desired or adaptive behavior change. If an individual fails to engage in behaviors related to his or her goals and desires, additional negative thoughts may follow which could maintain or potentially lead to more negative emotional states and maladaptive behavior patterns. Thus, this

maladaptive cycle may perpetuate itself and ultimately take an individual further away from his or her goals.

If we apply this model to weight management, the following scenario may occur. An individual desiring to lose weight may have a negative thought about himself or herself (e.g., “I’ll never be able to follow a diet” or “I’m a failure”) following an episode of overeating or eating food off of his or her diet. These types of negative thoughts often result in negative emotions (e.g., depression, apathy), which may then lead to unhealthy eating and exercise behaviors (Anton & Miller, 2005). These unhealthy eating and exercise practices may then contribute to additional negative thoughts since they are incongruent with the individual’s desired behavior pattern and weight loss goals. Thus, the initial intent to lose weight through healthy eating can become disrupted by a negative interpretation of one lapse and can lead to a cycle of negative thoughts, emotions, and behaviors.

The cycle described above may partially explain the difficulty many individuals experience with weight loss maintenance. Following an initial weight loss, which generally occurs during the first six months in supervised weight loss programs, most individuals struggle to lose additional weight. Moreover, the same or similar amount of effort that was put forth during the initial weight loss phase is typically required to maintain the new body weight. Oftentimes, weight gain occurs during this time because the previous reinforcer (i.e., weight loss) that was maintaining adherence to changes in diet and physical activity is no longer present. Consequently, an individual may perceive the “costs” associated with continued dietary control and engagement in physical activity to be high and the “benefits” in terms of weight loss to be low. In line with this, a recent

review of long-term (≥ 1 year) outcomes associated with calorie-reducing diets concluded that most individuals are unable to achieve successful weight loss maintenance by dieting alone (Mann, Tomiyama & Westling, 2007). For many individuals, a small weight regain may lead to attributions of personal ineffectiveness, negative emotions, and ultimately an abandonment of the weight management efforts (Elfhag & Rossner, 2005).

IV. Strategies to Promote Adherence

In order to develop strategies to prevent this negative cycle from occurring, it may be helpful to examine psychological and behavioral factors that have been associated with long-term behavior change, which is what appears to be necessary for sustained weight loss. In a study that examined the behavioral correlates of individuals who successfully maintained weight loss ($> 5\%$ of initial weight) over three years (Westenhoefer et al., 2004), the following variables were found to be associated with long-term weight maintenance: flexible control of eating, a regular eating pattern, choosing low-fat, low calorie vs. high fat high calorie foods, meal rhythm, meal situations, physical activity, and coping with stress. Based on these findings, the authors concluded that “successful long-term weight reduction is a complex process of behavioral change.” Data obtained from the National Weight Control Registry, a database of individuals who have maintained a 30 pound or greater weight loss for over one year, are in line with this conclusion. Individuals in this database report consuming a low-calorie, low-fat diet, eating regular meals, limiting food choices, weighing regularly, and engaging in high levels of physical activity (McGuire et al, 1998; Wing et al, 2001). Taken as a whole, these findings suggest that successful long-term maintenance requires

that an individual to change his or her entire lifestyle rather than a single aspect of personal behavior.

It is interesting to note that individuals who successfully maintain weight loss utilize strategies that are typically taught in behavioral treatments, whereas relapsers do not (see Table 1). This suggests that these strategies are effective when used consistently. Most lifestyle interventions related to weight management teach participants the following behavioral skills: self-monitoring, goal-setting, stimulus control, problem-solving, relapse prevention, scheduling/time management, cognitive restructuring, and obtaining social support. Interventions that incorporate these strategies have been found to be effective in helping participants achieve weight reductions of 5-10 kg (approximately 5–10% of initial body weight; Powell, 2007). However, the clinical significance of any weight reduction is ultimately determined by whether the loss is sustained over the long-term rather than the short-term.

V. Treatment Approaches that Facilitate Long-Term Change

A recent review of multi-component lifestyle interventions with follow-ups of at least two years concluded that “There is consistent and strong evidence that lifestyle interventions for obesity can produce modest but clinically significant reductions in weight with minimal risk (Powell et al., 2007).” Studies to date indicate that extending the length of treatment has a positive effect on long-term weight loss outcomes (Perri et al., 2007). For example, Perri and colleagues (Perri et al., 1989) found that participants who were assigned to an extended treatment program increased their weight losses by 35% from week 20 to week 40 while those in the standard length program regained a small amount of weight during this same time period. Other recent studies suggest that treatment programs of indefinite duration that

incorporate continuous contact with participants promote maintenance of long-term weight loss (Latner, Stunkard & Wilson, 2002; Latner, Stunkard, & Wilson, 2006). Indeed, increased social support following initial weight loss has been found to enhance weight loss maintenance in a number of studies (e.g., Perri et al., 1984; Wing & Jeffery, 1999). Potential reasons extended treatment improves weight loss outcomes include increased accountability and social support, as well as enhanced problem-solving of barriers.

In addition to the benefits of extending treatment and incorporating social support and problem solving in maintenance programs, future interventions may be improved by increasing the amount of time devoted to teaching cognitive coping skills during treatment. As described above, critical or negative automatic thoughts can interact with emotions and behavior patterns and can lead to maladaptive cycles that may worsen the initial problem. Thus, cognitive coping skills can be a critical component to weight loss treatments as well as other health promotion interventions because they teach individuals how to identify and replace unrealistic, negative thought patterns with more positive, but realistic thoughts (Beck 1998). By helping individuals identify self-defeating thoughts that may be contributing to their maladaptive emotional and behavioral patterns, cognitive coping skills can assist individuals in adopting and maintaining the behavior changes needed for healthy weight management.

Cognitive coping skills may be particularly helpful to individuals who eat in response to negative emotions (i.e., emotional eating) because they may be prone to fall into the negative cycle described earlier. These individuals may think negative thoughts about themselves and their ability to follow a healthy weight management program in response to an emotional eating episode. By learning to adopt more adaptive thinking patterns,

individuals can break free of this negative cycle. It is worth noting that cognitive coping skills are not quickly learned as changing one's thinking pattern takes time and considerable effort. For example, in Aaron Beck's cognitive therapy, treatment typically lasts for at least twelve weeks and consists of weekly meetings in addition to homework assignments to practice these skills (Beck, 1997).

In summary, future weight loss treatments would likely be enhanced by not only extending treatment duration but also by adding an increased focus on the role thoughts have in influencing emotions and behaviors. By teaching individuals how to utilize cognitive coping skills in their daily life, long-term weight loss outcomes may be improved because participants will become better able to manage their emotions and behaviors. This should increase the likelihood that these individuals will adhere to healthy dietary and physical activity patterns over the long-term. Thus, by extending treatment length and providing individuals with extensive training in cognitive coping skills, in addition to behavioral self-management skills, future treatments should be more effective in helping participants not only lose weight but also keep it off over the long run.

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