Health Behaviors

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CHAPTER OUTLINE

In Chapter 3, we address health behaviors. At the core of this chapter is the idea that good health is achievable through health behaviors that are practiced conscientiously.

■ AN INTRODUCTION TO HEALTH BEHAVIORS

Role of Behavioral Factors in Disease and Disorder

In the past century, patterns of disease in the United States have changed substantially. As noted in Chapter 1, there has been a decline in acute infectious disorders due to changes in public health standards, but there has been an increase in the preventable disorders, including lung cancer, cardiovascular disease, alcohol and drug abuse, and vehicular accidents. The role of behavioral factors in the development of these disorders is clear (Table 3.1). Nearly half the deaths in the United States are caused by preventable factors, with smoking, obesity, and problem drinking being three of the main causes (Centers for Disease Control and Prevention, 2009a).

■ HEALTH PROMOTION: AN OVERVIEW

Research on preventable risk factors adopts the perspective of health promotion. **Health promotion** is a philosophy that has at its core the idea that good health, or wellness, is a personal and collective achievement. For the individual, it involves developing a program of good health habits. For the medical practitioner,

TABLE 3.1 | Risk Factors for the Leading Causes of Death in the United States

Disease	Risk Factors
Heart disease	Tobacco, high cholesterol, high blood pressure, physical inactivity, obesity, diabetes, stress
Cancer	Smoking, unhealthy diet, environmental factors
Stroke	High blood pressure, tobacco, diabetes, high cholesterol, physical inactivity, obesity
Accidental injuries	On the road (failure to wear seat belts), in the home (falls, poison, fire)
Chronic lung disease	Tobacco, environmental factors (pollution, radon, asbestos)

Sources: American Cancer Society, 2009a; American Heart Association, 2009a; Centers for Disease Control and Prevention, April 2009.

health promotion involves teaching people how to achieve a healthy lifestyle and helping people **at risk** for particular health problems offset or monitor those risks. For the health psychologist, health promotion involves the development of interventions to help people practice healthy behaviors. For community and national policy makers, health promotion involves emphasizing good health and providing information and resources to help people change poor health habits.

Successful modification of health behaviors will have several beneficial effects. First, it will reduce deaths due to lifestyle-related diseases. Second, it may delay time of death, thereby increasing life expectancy. Third and most important, the practice of good health behaviors may expand the number of years during which a person may enjoy life free from the complications of chronic disease. Finally, modification of health behaviors may begin to make a dent in the more than $3.0 trillion that is spent yearly on health and illness (National Health Expenditures, 2014).

Health Behaviors and Health Habits

Health behaviors are behaviors undertaken by people to enhance or maintain their health. A **health habit** is a health behavior that is firmly established and often performed automatically, without awareness. These habits usually develop in childhood and begin to stabilize around age 11 or 12 (Cohen, Brownell, & Felix, 1990). Wearing a seat belt, brushing one's teeth, and eating a healthy diet are examples of these behaviors. Although a health habit may develop initially because it is reinforced by positive outcomes, such as parental approval, it eventually becomes independent of the reinforcement process. For example, you may brush your teeth automatically before going to bed. As such, habits can be highly resistant to change. Consequently, it is important to establish good health behaviors and to eliminate poor ones early in life.

An illustration of the importance of good health habits is provided by a classic study of people living in Alameda County, California, conducted by Belloc and Breslow (1972). These scientists focused on several important health habits:

- Sleeping 7 to 8 hours a night
- Not smoking
- Eating breakfast each day
- Having no more than one or two alcoholic drinks each day

- Getting regular exercise
- Not eating between meals
- Being no more than 10 percent overweight

The scientists asked nearly 7,000 county residents to indicate which of these behaviors they practiced. Residents were also asked about the illnesses they had had, what their energy level had been, and how disabled they had been (for example, how many days of work they had missed) over the previous 6-to-12-month period. The researchers found that the more good health habits people practiced, the fewer illnesses they had had, the better they had felt, and the less disabled they had been.

A follow-up of these people 9–12 years later found that mortality rates were dramatically lower for people practicing the seven health habits. Men following these practices had a mortality rate of only 28 percent and women had a mortality rate of 43 percent, compared to men and women who practiced zero to three of these health habits (Breslow & Enstrom, 1980).

Primary Prevention   Instilling good health habits and changing poor ones is the task of **primary prevention.** This means taking measures to combat risk factors for illness before an illness has a chance to develop. There are two general strategies of primary prevention. The first and most common strategy is to get people to alter their problematic health behaviors, such as helping people lose weight through an intervention. The second, more recent approach is to keep people from developing poor health habits in the first place. Smoking prevention programs with young adolescents are an example of this approach, which we will consider in Chapter 5.

Practicing and Changing Health Behaviors: An Overview

What factors lead one person to live a healthy life and another to compromise his or her health?

Demographic Factors   Younger, more affluent, better-educated people with low levels of stress and high levels of social support typically practice better health habits than people under higher levels of stress with fewer resources (Hanson & Chen, 2007).

Age   Health habits are typically good in childhood, deteriorate in adolescence and young adulthood, but improve again among older people.

Values   Values affect the practice of health habits. For example, exercise for women may be considered desirable in one culture but undesirable in another (Guilamo-Ramos, Jaccard, Pena, & Goldberg, 2005).

Personal Control   People who regard their health as under their personal control practice better health habits than people who regard their health as due to chance. The **health locus of control** scale (Table 3.2) (Wallston, Wallston, & DeVellis, 1978) measures the degree to which people perceive their health to be under personal control, control by the health practitioner, or chance.

Social Influence   Family, friends, and workplace companions influence health-related behaviors, sometimes in a beneficial direction, other times in an adverse direction (Blumberg, Vahratian, & Blumberg, 2014). For example, peer pressure often leads to smoking in adolescence but may influence people to stop smoking in adulthood.

Personal Goals and Values   Health habits are tied to personal goals. If personal fitness is an important goal, a person is more likely to exercise.

Perceived Symptoms   Some health habits are controlled by perceived symptoms. For example, a smoker who wakes up with a smoker's cough and raspy throat may cut back in the belief that he or she is vulnerable to health problems at that time.

Access to the Health Care Delivery System   Access to the health care delivery system affects health behaviors. For example, obtaining a regular Pap smear, getting mammograms, and receiving immunizations for childhood diseases depend on access to health care. Other behaviors, such as losing weight and stopping smoking, may be indirectly encouraged by the health care system through lifestyle advice.

Knowledge and Intelligence   The practice of health behaviors is tied to cognitive factors, such as knowledge and intelligence (Mõttus et al., 2014). More knowledgeable and smarter people typically take better care of themselves. People who are identified as intelligent in childhood have better health-related biological profiles in adulthood, which may be explained by their practice of better health behaviors in early life (Calvin, Batty, Lowe, & Deary, 2011).

TABLE 3.2 | Health Locus of Control

Health locus of control assesses whether you think you control your health or whether you believe it's controlled by health care professionals or by chance. Here are some examples of items that assess health locus of control. For each item, circle the number that represents the extent to which you agree or disagree with that statement.

1 Strongly Disagree (SD)   4 Slightly Agree (A)
2 Moderately Disagree (MD)   5 Moderately Agree (MA)
3 Slightly Disagree (D)   6 Strongly Agree (SA)

	SD	MD	D	A	MA	SA
1. If I get sick, it is my own behavior that determines how soon I get well again.	1	2	3	4	5	6
2. Most things that affect my health happen to me by accident.	1	2	3	4	5	6
3. Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5	6
4. I am in control of my health.	1	2	3	4	5	6
5. Health professionals control my health.	1	2	3	4	5	6
6. My good health is largely a matter of good fortune.	1	2	3	4	5	6
7. If I take the right actions, I can stay healthy.	1	2	3	4	5	6

Source: Wallston, Wallston, & DeVellis, 1978; see http://www.vanderbilt.edu/nursing/kwallston/mhlcscales.htm for the complete scale.

Barriers to Modifying Poor Health Behaviors

There is often little immediate incentive for practicing good health behaviors, however. Health habits develop during childhood and adolescence when most people are healthy. Smoking, a poor diet, and lack of exercise have no apparent effect on health for years, and few children and adolescents are concerned about what their health will be like when they are 40 or 50 years old (Johnson, McCaul, & Klein, 2002). As a result, bad habits have a chance to make inroads.

Emotional Factors   Emotions may lead to or perpetuate unhealthy behaviors (Conner, McEachan, Taylor, O'Hara, & Lawton, 2015). Poor health behaviors can be pleasurable, automatic, addictive, and resistant to change. Moreover, threatening messages designed to change health behaviors can produce psychological distress and lead people to respond defensively, distorting risks to their health (Beckjord, Rutten, Arora, Moser, & Hesse, 2008; Good & Abraham, 2007). People may perceive a health threat to be less relevant than it really is, and they may falsely see themselves as less vulnerable than or dissimilar to other people with the same habit (Roberts, Gibbons, Gerrard, & Alert, 2011; Thornton, Gibbons, & Gerrard, 2002). Continuing to practice a risky behavior may itself lead people to minimize their risks and feel a false sense of security (Halpern-Felsher et al., 2001).

Instability of Health Behaviors   Health habits are only modestly related to each other. The person who exercises faithfully does not necessarily wear a seat belt, for example. Therefore, health behaviors must often be tackled one at a time. Health habits are unstable over time. A person may stop smoking for a year but take it up again during a period of high stress.

Why are health habits relatively independent of each other and unstable? First, different health habits are controlled by different factors. For example, smoking may be related to stress, whereas exercise depends heavily on ease of access to athletic facilities. Second, different factors may control the same health behavior for different people. One person's overeating may be "social," and she may eat primarily in the presence of other people, whereas another person may overeat only when under stress.

Third, factors controlling a health behavior may change over the history of the behavior (Costello, Dierker, Jones, & Rose, 2008). For example, although peer group pressure (social factors) is important in initiating smoking, over time, smoking may be maintained because it reduces feelings of stress.

Fourth, factors controlling a health behavior may change across a person's lifetime. In childhood,

regular exercise is practiced because it is built into the school curriculum, but in adulthood, this behavior must be practiced intentionally.

In summary, health behaviors are elicited and maintained by different factors for different people, and these factors change over the lifetime as well as over the course of the health habit. Consequently, health habit interventions have focused heavily on those who may be helped the most—namely, children and adolescents (Patton et al., 2012).

Intervening with Children and Adolescents

Socialization
Health habits are strongly affected by early **socialization,** especially the influence of parents as both teachers and role models (Morrongiello, Corbett, & Bellissimo, 2008). Parents instill certain habits in their children (or not) that become automatic, such as brushing teeth regularly and eating breakfast every day. Nonetheless, in many families, even these basic health habits are not taught. Especially in families in which parents are separated or there is chronic family stress, health habits may slip through the cracks (Menning, 2006).

Moreover, as children move into adolescence, they sometimes ignore the early training they received from their parents. In addition, adolescents are exposed to alcohol consumption, smoking, drug use, and sexual risk taking, particularly if their parents aren't monitoring them very closely and their peers practice these behaviors (Andrews, Tildesley, Hops, & Li, 2002).

Using the Teachable Moment
Some times are better than others for modifying health practices. Health promotion efforts capitalize on these **teachable moments.** Many teachable moments arise in early childhood. Parents can teach their children basic safety behaviors, such as looking both ways before crossing the street, and basic health habits, such as drinking milk instead of soda with dinner.

Other teachable moments are built into the health care system. For example, many infants in the United States are covered by well-baby care. Pediatricians can make use of these visits to teach motivated new parents the basics of accident prevention and home safety. Many school systems require a physical at the beginning of the school year and require documentation of immunizations.

But what can children really learn about health habits? Surprisingly, quite a bit. Interventions with children indicate that choosing healthy foods, brushing teeth regularly, using car seats and seat belts, participating in exercise, crossing the street safely, and behaving appropriately in real or simulated emergencies (such as earthquake drills) are all within the ability of children as young as age 3 or 4, as long as the behaviors are explained concretely and the children know what to do (Maddux, Roberts, Sledden, & Wright, 1986).

Middle school is an important time for learning several health-related habits. For example, food choices, snacking, and dieting all crystallize around this time (Cohen et al., 1990). There is also a **window of vulnerability** for smoking and drug use during middle

The foundations for health promotion develop in early childhood, when children are taught to practice good health behaviors.
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Adolescence is a window of vulnerability for many poor health habits.
Consequently, intervening to prevent health habits from developing is a high priority
for children in late elementary and middle school.
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school, when students are first exposed to these habits among their peers (D'Amico & Fromme, 1997). Interventions through the schools may reduce these risks.

Teachable moments are not confined to childhood and adolescence. Pregnancy is a teachable moment for stopping smoking and improving diet (Heppner et al., 2011; Levitsky, 2004). The time period immediately after giving birth is also a teachable moment for increasing physical activity and regular exercise, as many new mothers want to get back to their previous level of fitness and appearance; but, barriers to physical activity need to be addressed as well, because new mothers may have many new responsibilities, leaving little time for behavior seen as optional (Fjeldsoe, Miller, & Marshall, 2013; Rhodes et al., 2014). Adults with newly diagnosed coronary artery disease are especially motivated to change contributing health habits such as smoking and poor diet.

Adolescent Health Behaviors and Adult Health   An important reason for intervening with adolescents is that precautions taken in adolescence may affect disease risk after age 45 more than do adult health behaviors. The health habits a person practices as a teenager or college student may determine which chronic diseases he or she develops and what the person ultimately dies of in adulthood. For adults who make changes in their lifestyle, it may already be too late. This is true for sun exposure and skin cancer and

for calcium consumption for the prevention of osteoporosis. Risk factors of other disorders such as coronary heart disease may also be strongly affected by health habits in childhood and adolescence as well.

Intervening with At-Risk People

I'm a walking time bomb.
> —37-year-old woman whose female relatives had breast cancer.

Another vulnerable group is people who are at risk for particular health problems. For example, people from families with a familial disorder may know that their personal risk is higher (Glenn et al., 2011). For example, a pediatrician may work with obese parents to control the diet of their offspring so that obesity in the children can be avoided.

Benefits of Focusing on At-Risk People
Working with at-risk populations can be an efficient and effective use of health promotion dollars. First, disease may be prevented altogether. For example, helping men with a family history of heart disease to stop smoking can prevent coronary heart disease. When a risk factor has implications for only some people, it makes sense to target those people for whom the risk factor is relevant. For example, people who have hypertension that implicates salt sensitivity need to be especially vigilant about controlling their salt intake.

Focusing on at-risk people helps to identify other factors that may increase risk. For example, not everyone who has a family history of hypertension will develop hypertension, but by focusing especially on people who are at risk, other factors that contribute to its development, such as diet, may be identified.

Problems of Focusing on At-Risk People

Clearly, however, there are difficulties in working with people at risk. People do not always perceive their risk correctly (Croyle et al., 2006). Most people are unrealistically optimistic and view their poor health behaviors as widely shared but their healthy behaviors as more distinctive. For example, smokers overestimate the number of other people who smoke.

Sometimes testing positive for a risk factor leads people into needless worry or hypervigilant behavior (DiLorenzo et al., 2006). People can become defensive, minimize the significance of their risk factor, and avoid using appropriate services or monitoring their condition.

Ethical Issues   At what point is it appropriate to alarm at-risk people if their personal risk is unknown? Not everyone at risk for a particular disorder will develop the problem and, in many cases, only many years later. For example, should adolescent daughters of breast cancer patients be alerted to their risk and alarmed at a time when they are coming to terms with their emerging sexuality and needs for self-esteem? Psychological distress may be created in exchange for instilling risk reduction behaviors (Croyle, Smith, Botkin, Baty, & Nash, 1997). Some people, such as those predisposed to depression, may react especially poorly to information about their risks. Moreover, in cases involving genetic risk factors, there may not be any effective intervention. For example, alcoholism has a genetic component, particularly among men, and yet exactly how to intervene with the offspring of adult alcoholics is not yet clear.

Emphasizing risks that are inherited can raise complicated issues of family dynamics. For example, daughters of breast cancer patients may suffer stress and exhibit behavior problems, due in part to the enhanced recognition of their risk (Taylor, Lichtman, & Wood, 1984a). Intervening with at-risk populations remains a controversial issue.

Health Promotion and Older Adults

John Rosenthal, 92, starts each morning with a brisk walk. After a light breakfast of whole wheat toast and orange juice, he gardens for an hour or two. Later, he joins a couple of friends for lunch, and if he can

Among older adults, health habits are a major determinant of whether an individual will have a vigorous or an infirmed old age.
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persuade them to join him, they fish during the early afternoon. Reading a daily paper and always having a good book to read keeps John mentally sharp. Asked how he maintains such a busy schedule, John says, "Exercise, friends, and mental challenge" are the keys to his long and healthy life.

Rosenthal's lifestyle is right on target. A chief focus of recent health promotion efforts has been older adults. At one time, it was thought that health promotion efforts are wasted in old age. However, policy makers now recognize that a healthy older adult population is essential not only for quality of life but also for controlling health care spending.

Health promotion efforts with older adults focus on several behaviors: maintaining a healthy, balanced diet; maintaining a regular exercise regimen; taking steps to reduce accidents; controlling alcohol consumption; eliminating smoking; reducing the inappropriate use of prescription drugs; obtaining vaccinations against influenza; and remaining socially engaged. Often, older adults have multiple issues or health habits that need modification, requiring an integrative biopsychosocial approach to their health care needs (Wild et al., 2014).

Exercise keeps older adults mobile and able to care for themselves, and it does not have to be strenuous. Participating in social activities, running errands, and engaging in light housework or gardening reduce the risk of mortality, perhaps by providing social support or a general sense of self efficacy (Glass, deLeon, Marottoli, & Berkman, 1999). Among the very old, exercise has particularly strong benefits (Kahana et al., 2002).

Controlling alcohol consumption is important for good health among older adults as well. Some older adults develop drinking problems in response to age-related issues, such as loneliness (Brennan & Moos, 1995). Others may try to maintain the drinking habits they had throughout their lives, which become more risky in old age. Metabolic changes related to age may reduce the capacity for alcohol. Moreover, many older people are on medications that may interact dangerously with alcohol, leading to accidents.

Proper medication use is essential to good health. Older adults who are poor may cut back on their medications to save money. Unfortunately, those who do are more likely to experience health problems within the next few years (Reitman, 2004, June 28).

Flu vaccination for older adults is an important health priority. Flu is a major cause of death among older adults, and it increases the risk of heart disease and stroke (Nichol et al., 2003).

Depression and loneliness are problems for older adults. They compromise health habits, leading to accelerated physical decline. Consequently, addressing these issues can have effects on physical health (Newall, Chipperfield, Bailis, & Stewart, 2013). Related problems of loneliness and social isolation can take a health toll on older adults, and so interventions to increase social engagement can promote this important health behavior (Thomas, 2011).

The emphasis on health habits among older adults is well placed. By age 80, health habits are the major determinant of whether a person will have a vigorous or an infirmed old age (McClearn et al., 1997). Moreover, the efforts to change older adults' health habits seem to be working: The health of our older adult population is improving (Lubitz, Cai, Kramarow, & Lentzner, 2003), and consequently, so is their well-being (Gana et al., 2013).

Ethnic and Gender Differences in Health Risks and Habits

Health promotion addresses ethnic and gender differences in vulnerability to health risks. For example, African American and Hispanic women get less exercise than do Anglo women and are more likely to be overweight (Pichon et al., 2007). Anglo and African American women are more likely to smoke than Hispanic women. Alcohol consumption is a greater problem among men than women, and smoking is a somewhat greater problem for Anglo men than for other groups.

Health promotion efforts with different ethnic groups need to take account of culturally different social norms. Culturally appropriate interventions include consideration of health practices in the community, informal networks of communication that can make interventions more successful, and language (Barrera, Toobert, Strycker, & Osuna, 2012; Toobert et al., 2011). Even efficient low-cost interventions such as text messaging and automated telephone messages can be successfully implemented when the messages are culturally adapted to the target group (Migneault et al., 2012).

Health promotion programs for ethnic groups also need to take account of co-occurring risk factors. The combined effects of low socioeconomic status and a biologic predisposition to particular illnesses, for example, put certain groups at great risk. Examples are diabetes among Hispanics and hypertension among African Americans, which we will consider in more detail in Chapter 13.

■ CHANGING HEALTH HABITS

> Habit is habit, and not to be flung out of the window by any man, but coaxed downstairs a step at a time.
> —Mark Twain

In the remainder of this chapter, we address how health behaviors can be changed.

Attitude Change and Health Behavior

Educational Appeals   Educational appeals make the assumption that people will change their health habits if they have good information about their habits. Early and continuing efforts to change health habits have consequently focused heavily on education and changing attitudes. Table 3.3 lists the characteristics that make health communications especially persuasive. More recently, though, the fact that attitude change may not lead to behavior change has prompted research on what additional factors may be involved (Siegel, Navarro, Tan, & Hyde, 2014). Also, the important automatic aspect of health habits has been incorporated into interventions, as unconscious

TABLE 3.3 | Educational Appeals

- Communications should be colorful and vivid rather than steeped in statistics and jargon. If possible, they should also use case histories (Arkes & Gaissmaier, 2012).
- The communicator should be expert, prestigious, trustworthy, likable, and similar to the audience.
- Strong arguments should be presented at the beginning and end of a message, not buried in the middle.
- Messages should be short, clear, and direct.
- Messages should state conclusions explicitly.
- Extreme messages produce more attitude change, but only up to a point. Very extreme messages are discounted. For example, a message that urges people to exercise for half an hour a day will be more effective than one that recommends 3 hours a day.
- For illness detection behaviors (such as HIV testing or obtaining a mammogram), emphasizing problems if the behaviors are not undertaken will be most effective. For health promotion behaviors (such as sunscreen use), emphasizing the benefits may be more effective.
- If the audience is receptive to changing a health habit, then the communication should include only favorable points, but if the audience is not inclined to accept the message, the communication should discuss both sides of the issue.
- Interventions should be sensitive to the cultural norms of the community to which they are directed. For example, family-directed interventions may be especially effective in Latino communities (Pantin et al., 2009).

and nonconscious influences on the practice of health habits have become increasingly apparent.

Fear Appeals   Attitudinal approaches to changing health habits often make use of **fear appeals.** This approach assumes that if people are afraid that a particular habit is hurting their health, they will change their behavior to reduce their fear. However, this relationship does not always hold.

Persuasive messages that elicit too much fear may actually undermine health behavior change (Becker & Janz, 1987). Moreover, fear alone may not be sufficient to change behavior. Specific action recommendations, such as where and how one can obtain a flu shot, may be needed (Self & Rogers, 1990). Moreover, as already noted, fear can increase defensiveness, which reduces how effective an appeal will be.

Message Framing   A health message can be phrased in positive or negative terms. For example, a reminder card to get a flu immunization can stress the benefits of being immunized or stress the discomfort of the flu itself (Gallagher, Updegraff, Rothman, & Sims, 2011). Which of these methods is more successful? Messages that emphasize problems seem to work better for behaviors that have uncertain outcomes, for health behaviors that need to be practiced only once, such as vaccinations (Gerend, Shepherd, & Monday, 2008), and for issues about which people are fearful

Fear appeals often alert people to a health problem but do not necessarily change behavior.

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(Gerend & Maner, 2011). Messages that stress benefits are more persuasive for behaviors with certain outcomes (Apanovitch, McCarthy, & Salovey, 2003). A meta-analysis of 94 studies indicated that messages stressing benefits are more effective than messages stressing risks for encouraging health behaviors, such as skin cancer prevention, smoking cessation, and physical activity (Gallagher & Updegraff, 2012). However, negative (loss) framing may stimulate thought about the health behavior (Bassett-Gunter, Martin Ginis, & Latimer-Cheung, 2013).

Which kind of message framing will most affect behavior also depends on people's personal characteristics (Covey, 2014). For example, people who have a promotion or approach orientation that emphasizes maximizing opportunities are more influenced by messages phrased in terms of benefits ("calcium will keep your bones healthy"), whereas people who have a prevention or avoidance orientation that emphasizes minimizing risks are more influenced by messages that stress the risks of not performing a health behavior ("low calcium intake will increase bone loss") (Updegraff, Emanuel, Mintzer, & Sherman, 2015). On the whole, promotion-oriented messages may be somewhat more successful in getting people to initiate behavior change, and prevention messages may be more helpful in getting them to maintain behavior change over time (Fuglestad, Rothman, & Jeffery, 2008).

The Health Belief Model

Attitudinal approaches to health behavior change have been formalized in several specific theories that have guided interventions to change health behaviors. An early influential attitude theory of why people practice health behaviors is the **health belief model** (Hochbaum, 1958; Rosenstock, 1966). According to this model, whether a person practices a health behavior depends on two factors: whether the person perceives a personal health threat, and whether the person believes that a particular health practice will be effective in reducing that threat.

Perceived Health Threat   The perception of a personal health threat is influenced by at least three factors: general health values, which include interest in and concern about health; specific beliefs about personal vulnerability to a particular disorder (Dillard, Ferrer, Ubel, & Fagerlin, 2012); and beliefs about the consequences of the disorder, such as whether they

are serious. Thus, for example, people may change their diet to include low cholesterol foods if they value health, feel threatened by the possibility of heart disease, and perceive that the personal threat of heart disease is severe (Brewer et al., 2007).

Perceived Threat Reduction   Whether a person believes a health measure will reduce threat has two subcomponents: whether the person thinks the health practice will be effective, and whether the cost of undertaking that measure exceeds its benefits (Rosenstock, 1974). For example, the man who is considering changing his diet to avoid a heart attack may believe that dietary change alone would not reduce his risk of a heart attack and that changing his diet would interfere with his enjoyment of life too much to justify taking the action. So, even if his perceived vulnerability to heart disease is great, he would probably not make any changes. A diagram of the health belief model applied to smoking is presented in Figure 3.1.

Support for the Health Belief Model   Many studies have used the health belief model to increase perceived risk and increase perceived effectiveness of steps to modify a broad array of health habits, ranging from health screening programs to smoking (e.g., Goldberg, Halpern-Felsher, & Millstein, 2002). The health belief model does, however, leave out an important component of health behavior change, and that is a sense of **self efficacy:** the belief that one can control one's practice of a particular behavior (Bandura, 1991). For example, smokers who believe they cannot stop smoking are unlikely to make the effort.

Other theories of health behavior change use a similar conceptual analysis of behavior change. For example, Protection Motivation Theory (Rogers, 1975) examines how people appraise health threats and how they appraise their abilities to manage threats. This theory, too, has guided many health interventions (Milne, Sheeran, & Orbell, 2000).

The Theory of Planned Behavior

Health beliefs go some distance in predicting when people will change their health habits. A theory that attempts to link health beliefs directly to behavior is Ajzen's **theory of planned behavior** (Ajzen & Madden, 1986; Fishbein & Ajzen, 1975).

According to this theory, a health behavior is the direct result of a behavioral intention. Behavioral intentions are themselves made up of three components:

FIGURE 3.1 | The Health Belief Model Applied to the Health Behavior of Stopping Smoking

Belief in health threat

— General health values
   (I am concerned about my health.)

— Specific beliefs about vulnerability
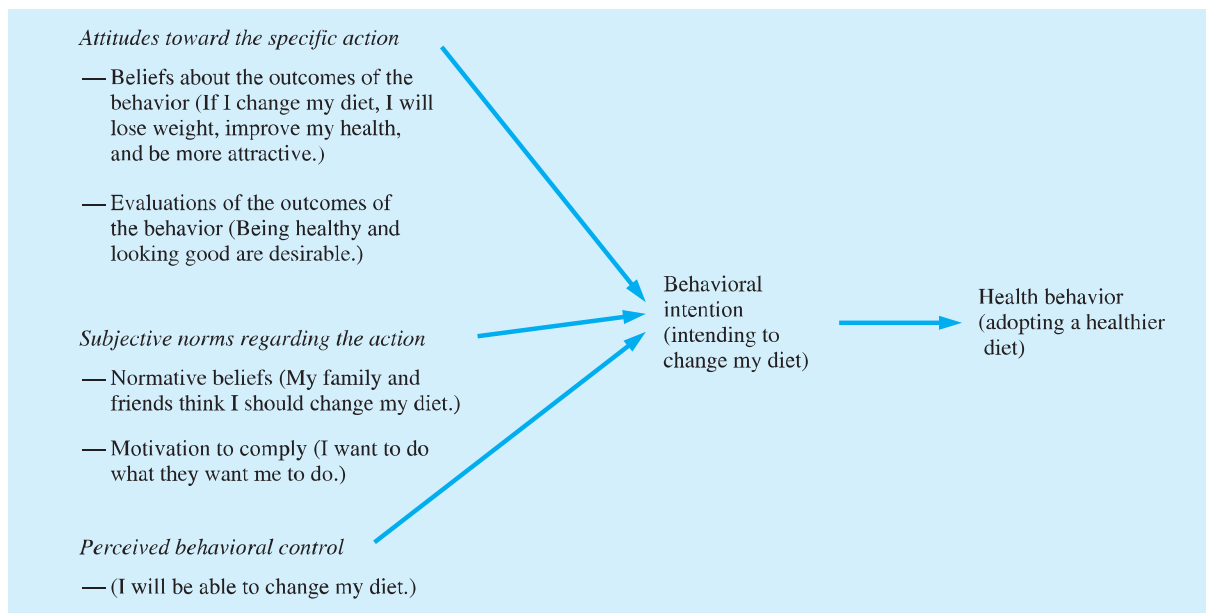   (As a smoker, I could get lung cancer.)

— Beliefs about severity of the disorder
   (I would die if I developed lung cancer.)

Health behavior
(I will stop smoking.)

Belief that specific health behavior can reduce threat

— Belief that specific measure can be effective
   against specific threat
   (If I stop smoking now, I will not develop lung cancer.)

— Belief that benefits of health measure exceed costs
   (Even though it will be hard to stop smoking, it is
   worth it to avoid the risk of lung cancer.)

attitudes toward the specific action, subjective norms regarding the action, and perceived behavioral control (Figure 3.2). Attitudes toward the action center on the likely outcomes of the action and evaluations of those outcomes. Subjective norms are what a person believes *others* think that person should do (normative beliefs) and the motivation to comply with those normative beliefs. Perceived behavioral control is the perception that one can perform the action and that the action will have the intended effect; this component of the model is similar to self efficacy. These factors combine to produce a behavioral intention and, ultimately, behavior change.

FIGURE 3.2 | The Theory of Planned Behavior Applied to Adopting a Healthy Diet   (*Sources:* Ajzen & Fishbein, 1980; Ajzen & Madden, 1986)

Attitudes toward the specific action

— Beliefs about the outcomes of the
   behavior (If I change my diet, I will
   lose weight, improve my health,
   and be more attractive.)

— Evaluations of the outcomes of
   the behavior (Being healthy and
   looking good are desirable.)

Subjective norms regarding the action

— Normative beliefs (My family and
   friends think I should change my diet.)

— Motivation to comply (I want to do
   what they want me to do.)

Perceived behavioral control

— (I will be able to change my diet.)

Behavioral
intention
(intending to
change my diet)

Health behavior
(adopting a healthier
diet)

To take a simple example, smokers who believe that smoking causes serious health outcomes, who believe that other people think they should stop smoking, who are motivated to comply with those normative beliefs, who believe that they are capable of stopping smoking, and who form a specific intention to do so will be more likely to stop smoking than people who do not hold these beliefs.

Evidence for the Theory of Planned Behavior

The theory of planned behavior predicts a broad array of health behaviors, and change in health behaviors (Montanaro & Bryan, 2014; McEachan, Conner, Taylor, & Lawton, 2011). Its components predict such behaviors as risky sexual activity among heterosexuals (Tyson, Covey, & Rosenthal, 2014; Davis et al., 2016), consumption of soft drinks (Kassem & Lee, 2004) and food safety practices (Milton & Mullan, 2012). Moreover, communications targeted to particular parts of the model, such as social norms, have been found to change behaviors (Reid & Aiken, 2013).

Criticisms of Attitude Theories

Because health habits are often deeply ingrained and difficult to modify, attitude-change interventions may provide the informational base for altering health habits but not always the impetus to take action (Ogden, 2003). Moreover, attitude change techniques assume that behavior changes are guided by conscious motivation, and these approaches ignore the fact that some behavior change occurs automatically and is not subject to awareness. That is, a general limitation of health behavior change models is the fact that they heavily emphasize conscious deliberative processes in practicing health behaviors; there is an important role for implicit automatic processes as well. Perhaps the most obvious example concerns health habits that are accomplished automatically in response to a minimal cue, such as putting on a seatbelt when one gets into a car.

Self Regulation and Health Behavior

Thus far, we have discussed changing health behaviors primarily through interventions designed to get people to alter their behavior. But people also change on their own. **Self regulation** refers to the fact that people control their own actions, emotions, and thoughts (Fiske & Taylor, 2013). A lot of self regulation is automatic, occurring without awareness or thought. But much self regulation is conscious, designed to meet personal goals and control thoughts, emotions, and behavior in service of those goals. Enhancing health behaviors requires effective self regulation (Mann, de Ridder, & Fujita, 2013) and interventions may need to be aimed at both the automatic and the conscious, controlled processes (Conroy, Maher, Elavsky, Hyde, & Doerksen, 2013).

Self Determination Theory

Self determination theory (SDT), a theory that also guides health behavior modification, builds on the idea that people are actively motivated to pursue their goals (Deci & Ryan, 1985; Ryan & Deci, 2000). The theory targets two important components as fundamental to behavior change, namely autonomous motivation and perceived competence. People are autonomously motivated when they experience free will and choice when making decisions. Competence refers to the belief that one is capable of making the health behavior change.

Accordingly, if a woman changes her diet because her physician tells her to, she may not experience a sense of autonomy and instead may experience her actions as under another's control. This may undermine her commitment to behavior change. However, if her dietary change is autonomously chosen, she will be intrinsically motivated to persist. SDT has given rise to interventions that target these beliefs, namely autonomous motivation and competence, and have shown some success in changing behaviors including smoking and adherence to medications (Bruzzese et al., 2014). A meta-analysis of 184 studies indicates support for self-determination theory and the importance of autonomous motivation for changing health behaviors (Ng et al., 2012).

Implementation Intentions

A theoretical model that emphasizes implementation intentions (Gollwitzer, 1999) integrates conscious processing with automatic behavioral enactment (Gollwitzer & Oettingen, 1998). When a person desires to practice a health behavior, it can be achieved by making a simple plan that links critical situations or environmental cues to goal-directed responses. For example, a person might tell herself, "When I finish breakfast, I will take out the dog's leash and walk her." The theory underscores the importance of planning exactly how, when, and where to implement a health behavior. Without these explicit links to action, the good intention might remain at the intention stage.

A second important feature of the theory is the idea that, by forming an implementation intention, a person can delegate the control of goal-directed responses to situational cues (e.g., completing breakfast), which may then elicit the behavior automatically (in this case, the action of taking out the leash to walk the dog). Over time, the link from the implementation to the goal-directed response becomes automatic and need not be brought into conscious awareness to be enacted.

Forming implementation intentions can be a simple but effective way to promote health behaviors (Martin, Sheeran, Slade, Wright, & Dibble, 2009). When a person has a particular health goal, such as remembering to use sunscreen, he or she can strategically engage automatic processes in an effort to make good on that goal. So, for example, a person wanting to practice better sun safety behaviors might say, "Whenever I am going to the beach, I will put on sunscreen first." Having created this implementation intention, she then delegates the control of sunscreen use to anticipated situational cues, in this case, getting ready to go to the beach (Gollwitzer, 1999). Thus, although the original implementation intention is consciously framed, the relation of the health behavior itself to the situation in which it is relevant becomes an automatic process (Sheeran, Gollwitzer, & Bargh, 2013). Adding implementation intentions to attitude models of health behavior has improved their ability to predict behavior (Milne, Orbell, & Sheeran, 2002). Results of a meta-analysis support the idea that changes in intentions lead to changes in behavior (Webb & Sheeran, 2006).

Self Affirmation Self affirmation occurs when people reflect upon their important values, personal qualities, or social relationships. When people are self affirmed, they become less defensive about personally relevant risk-related information (Schüz, Schüz, & Eid, 2013), which can set the stage for behavior change. A meta-analysis of 144 studies has shown that inducing self awareness when people are exposed to persuasive health information leads to positive changes in intentions and in actual health behaviors (Epton et al., 2015; Sweeney & Moyer, 2015).

Health Behavior Change and the Brain

Some successful health behavior change in response to persuasive messages occurs outside of awareness. Despite being inaccessible to conscious awareness, this change may be reflected in patterns of brain activation. Emily Falk and colleagues (Falk, Berkman, Mann, Harrison, & Lieberman, 2010) gave people persuasive messages promoting sunscreen use. People who showed significant activation in two particular brain regions, the medial prefrontal cortex (mPFC) and posterior cingulate cortex (pCC), in response to the messages increased their sunscreen use. Most important, attitude change about sunscreen use in response to the persuasive message only weakly predicted people's intentions to use sunscreen, but activity in these two brain regions quite strongly predicted sunscreen use, independent of attitudes and behavioral intentions. In other words, processes apparently not accessible to consciousness nonetheless significantly predicted changes in sunscreen use (Falk, Berkman, Whalen, & Lieberman, 2011).

What this pattern of brain activity means is not yet fully known. One possibility is that activity in mPFC and pCC reflects behavioral intentions at an implicit level that is not consciously accessible (Falk et al., 2010). Alternatively, activity in mPFC may be related to behavior change primarily because participants link the persuasive communication to the self. In any case, health behavior change can occur unconsciously, but the brain may detect these processes nonetheless.

■ COGNITIVE-BEHAVIORAL APPROACHES TO HEALTH BEHAVIOR CHANGE

Cognitive-Behavior Therapy (CBT)

Cognitive-behavior approaches to health habit modification focus on the target behavior itself, the conditions that elicit and maintain it, and the factors that reinforce it (Dobson, 2010). The most effective approach to health habit modification often comes from **cognitive-behavior therapy (CBT).** CBT interventions use several complementary methods to intervene in the modification of a target problem and its context. CBT may be implemented individually, through therapy in a group setting, or even on the Internet, and so it is a versatile as well as effective way of intervening to modify poor health habits.

Self Monitoring

Many programs of cognitive-behavioral modification use **self monitoring** as the first step toward behavior change. The rationale is that a person must understand the dimensions of the poor health habit before change can begin. Self monitoring assesses the frequency of a target behavior and the antecedents and consequences of that behavior.

The first step in self monitoring is to learn to discriminate the target behavior. For some behaviors, this step is easy. A smoker obviously can tell whether he or she is smoking. However, an urge to smoke may be less easily discriminated; therefore, the person may be trained to monitor internal sensations closely so as to identify the target behavior more readily.

A second stage in self monitoring is charting the behavior. For example, a smoker may keep a detailed record of smoking-related events, including when a cigarette is smoked, the time of day, the situation in which the smoking occurred, and the presence of other people (if any). She may also record the subjective feelings of craving that existed prior to lighting the cigarette, the emotional responses that preceded the lighting of the cigarette (such as anxiety or tension), and the feelings that were generated by the actual smoking of the cigarette. In this way, she can begin to get a sense of the conditions under which she is most likely to smoke. Each of these conditions can be a **discriminative stimulus** that is capable of eliciting the target behavior. For example, the sight and smell of food act as discriminative stimuli for eating. The sight of a pack of cigarettes or the smell of coffee may act as discriminative stimuli for smoking. The discriminative stimulus is important because it signals that a positive reinforcement will subsequently occur. CBT aims to eliminate or modify these discriminative stimuli. Although self monitoring is usually only a beginning step in behavior change, it may itself produce some behavior change (Quinn, Pascoe, Wood, & Neal, 2010). In fact, even being asked questions about a health behavior can launch behavior change (Rodrigues, O'Brien, French, Glidewell, & Sniehotta, 2015).

Stimulus Control

Once the circumstances surrounding the target behavior are well understood, the factors in the environment that maintain poor health habits such as smoking, drinking, and overeating, can be modified. **Stimulus-control interventions** involve ridding the environment of discriminative stimuli that evoke the problem behavior, and creating new discriminative stimuli, signaling that a new response will be reinforced.

For example, eating is typically under the control of discriminative stimuli, including the presence of desirable foods and activities (such as watching television). People desiring to lose weight can be encouraged to eliminate these discriminative stimuli for eating, such as ridding their home of rewarding and fattening foods, restricting their eating to a single place in the home, and

avoiding eating while engaged in other activities, such as watching television. Other stimuli might be introduced in the environment to indicate that controlled eating will now be followed by reinforcement. For example, people might place signs in strategic locations around the home, reminding them of reinforcements to be obtained after successful behavior change.

The Self Control of Behavior

Cognitive-behavior therapy focuses heavily on the beliefs that people hold about their health habits. People often generate internal monologues that interfere with their ability to change their behavior. For example, a person who wishes to give up smoking may derail the quitting process by generating self doubts ("I will never be able to give up smoking"). Unless these internal monologues are modified, the person will be unlikely to change a health habit and maintain that change over time.

Recognition that people's cognitions about their health habits are important in producing behavior change highlights another insight about the behavior change process: the importance of involving the client as co-therapist in the behavior-change intervention. Clients need to actively monitor their own behaviors and apply the techniques of cognitive-behavioral therapy to bring about change. As such, CBT emphasizes **self control.** The person acts as his or her own therapist and, together with outside guidance, learns to control the antecedents and consequences of the target behavior.

Cognitive restructuring trains people to recognize and modify their internal monologues to promote health behavior change. Sometimes the modified cognitions are antecedents to a target behavior. For example, if a smoker's urge to smoke is preceded by an internal monologue that he is weak and unable to control his smoking urges, these beliefs are targeted for change. The smoker would substitute a monologue that would help him stop smoking (for example, "I can do this" or "I'll be so much healthier"). Cognitions can also be the consequences of a target behavior. For example, an obese woman trying to lose weight might undermine her weight-loss program by reacting with hopelessness to every small dieting setback. She might learn, instead, to engage in self reinforcing cognitions following successful resistance to temptation and constructive self criticism following setbacks ("Next time, I'll keep those tempting foods out of my refrigerator").

Self Reinforcement   **Self reinforcement** involves systematically rewarding oneself to increase or decrease
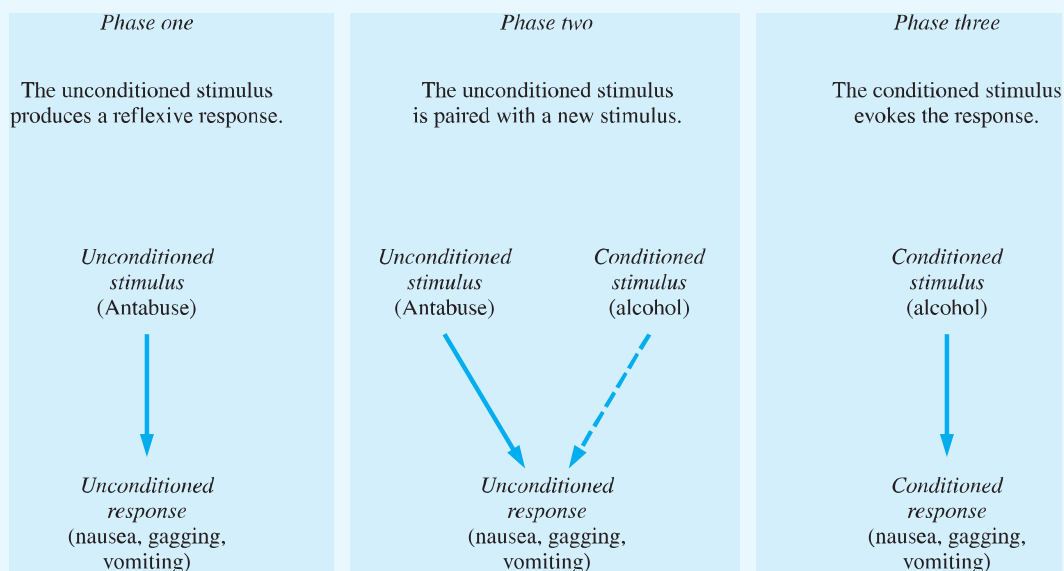
| BOX | 3.1 | Classical Conditioning |

First described by Russian physiologist Ivan Pavlov in the early 20th century, **classical conditioning** is the pairing of an unconditioned reflex with a new stimulus, producing a conditioned reflex. Classical conditioning is represented in Figure 3.3.

Classical conditioning was one of the first methods used for health behavior change. For example, consider its use in the treatment of alcoholism. Antabuse (unconditioned stimulus) is a drug that produces extreme nausea, gagging, and vomiting (unconditioned response) when taken in conjunction with alcohol. Over time, the alcohol becomes associated with the nausea and vomiting caused by the Antabuse and elicits the same nausea, gagging, and vomiting response (conditioned response) without the Antabuse being present.

Classical conditioning approaches to health habit modification do work, but clients know why they work. Alcoholics, for example, know that if they do not take the drug they will not vomit when they consume alcohol. Thus, even if classical conditioning has successfully produced a conditioned response, it is heavily dependent on the client's willing participation.

FIGURE 3.3 | A Classical Conditioning Approach to the Treatment of Alcoholism

Phase one	*Phase two*	*Phase three*
The unconditioned stimulus produces a reflexive response.	The unconditioned stimulus is paired with a new stimulus.	The conditioned stimulus evokes the response.
Unconditioned stimulus (Antabuse)	*Unconditioned stimulus* (Antabuse) *Conditioned stimulus* (alcohol)	*Conditioned stimulus* (alcohol)
Unconditioned response (nausea, gagging, vomiting)	*Unconditioned response* (nausea, gagging, vomiting)	*Conditioned response* (nausea, gagging, vomiting)

the occurrence of a target behavior. Positive self reward involves rewarding oneself with something desirable after successful modification of a target behavior, such as going to a movie following successful weight loss. Negative self reward involves removing an aversive factor in the environment after successful modification of the target behavior. An example of negative self reward is taking the Miss Piggy poster off the refrigerator once regular controlled eating has been achieved.

For example, suppose Mary smokes 20 cigarettes a day. She might first define a set of reinforcers that can be administered when particular smoking-reduction targets are met—reinforcements such as going out to dinner or seeing a movie. Mary may then set a particular reduction in her smoking as a target (such as 15 cigarettes a day). When that target is reached, she would administer a reinforcement (the movie or dinner out). The next step might be reducing smoking to 10 cigarettes a day, at which time she would receive another reinforcement. The target then might be cut progressively to 5, 4, 3, 2, 1, and none. Through this process, the target behavior of abstinence would eventually be reached.

Like self reward, self punishment is of two types. Positive self punishment involves the administration of an unpleasant stimulus to punish an undesirable behavior. For example, a person might self administer a mild electric shock each time he or she experiences a desire

In contrast to classical conditioning, which pairs an automatic response with a new stimulus, operant conditioning pairs a voluntary behavior with systematic consequences. The key to **operant conditioning** is reinforcement. When a person performs a behavior and that behavior is followed by positive reinforcement, the behavior is more likely to occur again. Similarly, if an individual performs a behavior and reinforcement is withdrawn or the behavior is punished, the behavior is less likely to be repeated. Over time, these contingencies build up those behaviors paired with positive reinforcement, whereas behaviors that are punished or not rewarded decline.

Many health habits can be thought of as operant responses. For example, drinking may be maintained because mood is improved by alcohol, or smoking may occur because peer companionship is associated with it. In these cases, reinforcement maintains the poor health behavior. Thus, using this principle to change behavior requires altering the reinforcement.

An important feature of operant conditioning is the reinforcement schedule. A continuous reinforcement schedule means that a behavior is reinforced every time it occurs. However, continuous reinforcement is vulnerable to extinction: If the behavior is occasionally not paired with reinforcement, the individual may cease performing the behavior, having come to anticipate reinforcement each time. Psychologists have learned that behavior is often more resistant to extinction if it is maintained by a variable or an intermittent reinforcement schedule than a continuous reinforcement schedule.

to smoke. Negative self punishment consists of withdrawing a positive reinforcer in the environment each time an undesirable behavior is performed. For example, a smoker might rip up money each time he or she has a cigarette that exceeds a predetermined quota. Self punishment is effective only if people actually perform the punishing activities. If self punishment becomes too aversive, people often abandon their efforts.

One form of self punishment that is effective in behavior modification is **contingency contracting.** In contingency contracting, an individual forms a contract with another person, such as a therapist or one's spouse, detailing what rewards or punishments are contingent on the performance or nonperformance of a behavior. For example, a person who wants to stop drinking might deposit a sum of money with a therapist and arrange to be fined each time he or she has a drink and to be rewarded each day that he or she abstained.

Behavioral Assignments A technique for increasing client involvement is **behavioral assignments,** home practice activities that support the goals of a therapeutic intervention. Behavioral assignments are designed to provide continuity in the treatment of a behavior problem. For example, if an early session with an obese client involved training in self monitoring, the client would be encouraged to keep a log of his eating behavior, including the circumstances in which it occurred. This log could then be used by the therapist and the patient at the next session to plan future behavioral interventions. Figure 3.4 gives an example of the behavioral assignment technique. Note that it includes homework assignments for both client and

FIGURE 3.4 | Example of a Systematic Behavioral Assignment for an Obese Client
(*Source:* Shelton & Levy, 1981, p. 6)

Homework for Tom [client]

Using the counter, count bites taken.

Record number of bites, time, location, and what you ate.

Record everything eaten for 1 week.

Call for an appointment.

Bring your record.

Homework for John [therapist]

Reread articles on obesity.

Modeling is learning that occurs from witnessing another person perform a behavior (Bandura, 1969). Observation and subsequent modeling can be effective approaches to changing health habits. For example, in one study high school students who observed others donating blood were more likely to do so themselves (Sarason, Sarason, Pierce, Shearin, & Sayers, 1991).

Similarity is an important principle in modeling. To the extent that people perceive themselves as similar to the type of person who engages in a risky behavior, they are likely to do so themselves; if people see themselves as similar to the type of person who does not engage in a risky behavior, they may change their behavior (Gibbons & Gerrard, 1995). For example, a swimmer may decline a cigarette from a friend because she perceives that most great swimmers do not smoke.

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therapist. This technique can ensure that both parties remain committed to the behavior-change process and that each is aware of the other's commitment.

The chief advantages of behavioral assignments are that (1) the client becomes involved in the treatment process, (2) the client produces an analysis of the behavior that is useful in planning further interventions, (3) the client becomes committed to the treatment process through a contractual agreement to discharge certain responsibilities, (4) responsibility for behavior change is gradually shifted to the client, and (5) the use of homework assignments increases the client's sense of self control.

Social Skills and Relaxation Training

Some poor health habits develop in response to the anxiety people experience in social situations. For example, adolescents often begin to smoke to reduce their nervousness in social situations by trying to communicate a cool, sophisticated image. Drinking and overeating may also be responses to social anxiety. Social anxiety can then act as a cue for the maladaptive habit, necessitating an alternative way of coping with the anxiety.

Consequently, many health habit modification programs include either **social skills training** or **assertiveness training,** or both, as part of the intervention package. People are trained in methods that help them deal more effectively with social anxiety.

Relaxation Training Many poor health habits are caused or maintained by stressful circumstances, and so managing stress is important to successful behavior change. A mainstay of stress reduction is **relaxation training** involving deep breathing and progressive muscle relaxation. In deep breathing, a person takes deep, controlled breaths, which decreases heart rate and blood pressure and increases oxygenation of the blood. People typically engage in deep breathing spontaneously when they are relaxed. In progressive muscle relaxation, an individual learns to relax all the muscles in the body progressively to discharge tension or stress.

Motivational Interviewing

Motivational interviewing (MI) is increasingly used in health promotion interventions. Originally developed to treat addiction, the techniques have been adapted to target smoking, dietary improvements, exercise, cancer screening, and sexual behavior, among other habits (Miller & Rose, 2009). Motivational interviewing is a client-centered counseling style designed to get people to work through any ambivalence they experience about changing their health behaviors. It may be especially effective for people who are initially wary about whether to change their behavior (Resnicow et al., 2002).

In motivational interviewing, the interviewer adopts a nonjudgmental, nonconfrontational, encouraging, and supportive style. The goal is to help the client express the positive or negative thoughts he or she has regarding the behavior in an atmosphere that is free of negative evaluation (Baldwin, Rothman, Vander Weg, & Christensen, 2013). Typically, clients talk at least as much as counselors during MI sessions.

In motivational interviewing, there is no effort to dismantle the denial or irrational beliefs that often accompany bad health behaviors or even to persuade a client to stop drinking, quit smoking, or otherwise improve health. Rather, the goal is to get the client to think through and express some of his or her own reasons for and against behavior change. The interviewer listens and provides encouragement in lieu of giving advice (Miller & Rose, 2009).

Relapse Prevention

One of the biggest problems faced in health habit modification is the tendency for people to relapse. Following initial successful behavior change, people often return to their old bad habits. Relapse is a particular problem with the addictive disorders of alcoholism, smoking, drug addiction, and overeating (Brownell, Marlatt, Lichtenstein, & Wilson, 1986), but it can be a problem for all behavior change efforts.

What do we mean by "relapse"? A single cigarette smoked at a party or the consumption of a pint of ice cream on a lonely Saturday night need not lead to full-blown relapse. However, that one cigarette or that single pint of ice cream can produce what is called an **abstinence violation effect**—that is, a feeling of loss of control that results when a person has violated self imposed rules. The result can be a more serious relapse, as the person's resolve falters. This is especially true for addictive behaviors because the person must also cope with the reinforcing impact of the substance itself.

Reasons for Relapse   Why do people relapse? Initially when people change their behaviors, they are vigilant, but over time, vigilance fades and the likelihood of relapse increases. For example, people may find themselves in situations where they used to smoke or drink, such as a party, and relapse at that vulnerable moment. People with low self efficacy for the behavior change initially are more likely to relapse. Sometimes, people think they have beaten the health problem, and so giving in to a temptation would have few costs (e.g., "a couple drinks would relax me").

A potent catalyst for relapse is negative affect (Witkiewitz & Marlatt, 2004). Relapse is more likely when people are depressed, anxious, or under stress. For example, when people are breaking off a relationship or encountering difficulty at work, they are vulnerable to relapse. Peter Jennings, the national newscaster who died of lung cancer in 2005, had relapsed to smoking after the September 11, 2001 terrorist attacks. Figure 3.5 illustrates the relapse process. Because of the high risk of relapse, behavioral interventions build in techniques to try to reduce its likelihood.

Relapse prevention should be integrated into treatment programs from the outset. Enrolling people who are initially committed and motivated to change their behavior reduces the risk of relapse and weeds out people who are not truly committed to behavior change. Although prescreening people for an

FIGURE 3.5 | A Cognitive-Behavioral Model of the Relapse Process   This figure shows what happens when a person is trying to change a poor health habit and faces a high-risk situation. With adequate coping responses, the person may be able to resist temptation, leading to a low likelihood of relapse. Without adequate coping responses, however, perceptions of self efficacy may decline and perceptions of the rewarding effects of the poor health behavior may increase, leading to an increased likelihood of relapse.   (*Source:* Larimer, Palmer, & Marlatt, 1999)
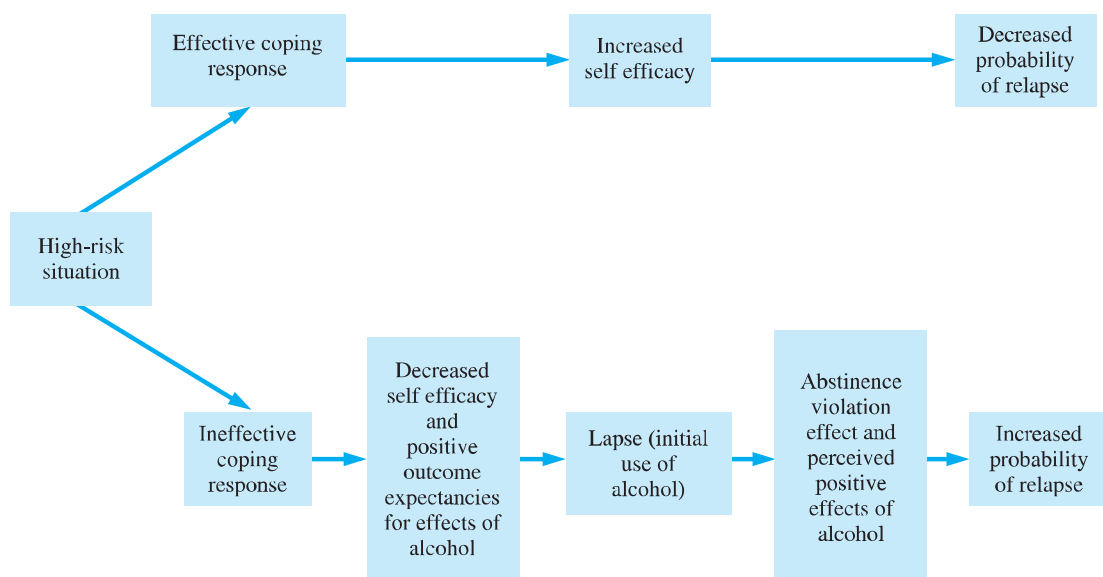
intervention may seem ethically problematic, including people who are likely to relapse may demoralize other participants in a behavior-change program, demoralize the practitioner, and ultimately make it more difficult for the relapser to change his or her behavior.

Relapse prevention techniques include asking people to identify the situations that may lead to relapse so they can help them develop coping skills that will help them to manage that stressful event. For example, overcoming the temptation to drink at bars might be fostered by scheduling lunches with friends instead. Or, at parties, a person might have a sham drink of club soda, instead of an alcoholic beverage. Mentally rehearsing coping responses in a high-risk situation can promote feelings of self efficacy. For example, some programs train participants to engage in constructive **self talk** that will help them talk themselves through tempting situations (Brownell et al., 1986).

Cue elimination involves restructuring the environment to avoid situations that evoke the target behavior (Bouton, 2000). For example, the alcoholic who drank exclusively in bars can avoid bars. For other habits, however, cue elimination is impossible. For example, smokers are usually unable to completely eliminate the circumstances in their lives that led them to smoke. Consequently, some relapse prevention programs deliberately expose people to situations that evoke the old behavior to give them practice in using their coping skills (Marlatt, 1990). Making sure that the new habit (such as exercise or alcohol abstinence) is practiced in as many new contexts as possible also ensures that it endures (Bouton, 2000).

Lifestyle Rebalancing   Long-term maintenance of behavior change can be promoted by leading the person to make other health-oriented lifestyle changes, a technique termed **lifestyle rebalancing.** Lifestyle changes, such as adding an exercise program or using stress management techniques, may promote a healthy lifestyle more generally and help reduce the likelihood of relapse.

The role of social support in maintaining behavior change is equivocal. At present, some studies suggest that enlisting the aid of family members in maintaining behavior change is helpful, but other studies suggest not (Brownell et al., 1986). Possibly, research has not yet identified the exact ways in which social support may help maintain behavior change.

Overall, relapse prevention is most successful when people perceive their behavior change to be a long-term goal, develop coping techniques for managing high-risk situations, and integrate their behavior change into a generally healthy lifestyle. In a meta-analysis of 26 studies with more than 9,000 participants treated for alcohol, tobacco, cocaine, and other substance use, Irvin and colleagues (Irvin, Bowers, Dunn, & Wang, 1999) concluded that relapse prevention techniques were effective for reducing substance use and improving psychosocial functioning.

Evaluation of CBT

The advantages of CBT for health behavior change are several. First, a carefully selected set of techniques can deal with all aspects of a problem (van Kessel et al., 2008): Self observation and self monitoring define the dimensions of a problem; stimulus control enables a person to modify antecedents of behavior; self reinforcement controls the consequences of a behavior; and social skills and relaxation training may replace the maladaptive behavior, once it has been brought under some degree of control.

A second advantage is that the therapeutic plan can be tailored to each individual's problem. Each person's faulty health habit and personality are different, so, for example, the particular package identified for one obese client may not be the same as that developed for another obese client (Schwartz & Brownell, 1995). Third, the range of skills imparted by multimodal interventions may enable people to modify several health habits simultaneously, such as diet and exercise, rather than one at a time (Persky, Spring, Vander Wal, Pagoto, & Hedeker, 2005; Prochaska & Sallis, 2004). Overall, CBT interventions have shown considerable success in modifying a broad array of health behaviors.

■ THE TRANSTHEORETICAL MODEL OF BEHAVIOR CHANGE

Changing a bad health habit does not take place all at once. People go through stages while they are trying to change their health behaviors (Prochaska, 1994; Rothman, 2000).

Stages of Change

J. O. Prochaska and his associates (Prochaska, 1994; Prochaska, DiClemente, & Norcross, 1992) developed the **transtheoretical model of behavior change,** a model that analyzes the stages and processes people go through in bringing about a change in behavior and

suggested treatment goals and interventions for each stage. Originally developed to treat addictive disorders, such as smoking, drug use, and alcohol addiction, the stage model has now been applied to a broad range of health habits, including exercising and sun protection behaviors (Adams, Norman, Hovell, Sallis, & Patrick, 2009; Hellsten et al., 2008).

Precontemplation   The precontemplation stage occurs when a person has no intention of changing his or her behavior. Many people in this stage are not aware that they have a problem, although families, friends, neighbors, or coworkers may well be. An example is the problem drinker who is largely oblivious to the problems he creates for his family. Sometimes people in the precontemplative phase seek treatment if they have been pressured by others to do so. Not surprisingly, these people often revert to their old behaviors and so make poor targets for intervention.

Contemplation   Contemplation is the stage in which people are aware that they have a problem and are thinking about it but have not yet made a commitment to take action. Many people remain in the contemplation stage for years. Interventions aimed at increasing receptivity to behavior change can be helpful at this stage (Albarracín, Durantini, Earl, Gunnoe, & Leeper, 2008).

Preparation   In the preparation stage, people intend to change their behavior but have not yet done so

successfully. In some cases, they have modified the target behavior somewhat, such as smoking fewer cigarettes than usual, but have not yet made the commitment to eliminate the behavior altogether.

Action   The action stage occurs when people modify their behavior to overcome the problem. Action requires the commitment of time and energy to making real behavior change. It includes stopping the behavior and modifying one's lifestyle and environment to rid one's life of cues associated with the behavior.

Maintenance   In the stage of maintenance, people work to prevent relapse and to consolidate the gains they have made. For example, if a person is able to remain free of an addictive behavior for more than 6 months, he or she is assumed to be in the maintenance stage (Wing, 2000).

Because relapse is the rule rather than the exception with many health behaviors, this stage model is conceptualized as a spiral. As Figure 3.6 indicates, a person may take action, attempt maintenance, relapse, return to the precontemplation phase, cycle through the subsequent stages to action, repeat the cycle again, and do so several times until they have eliminated the behavior (Prochaska et al., 1992).
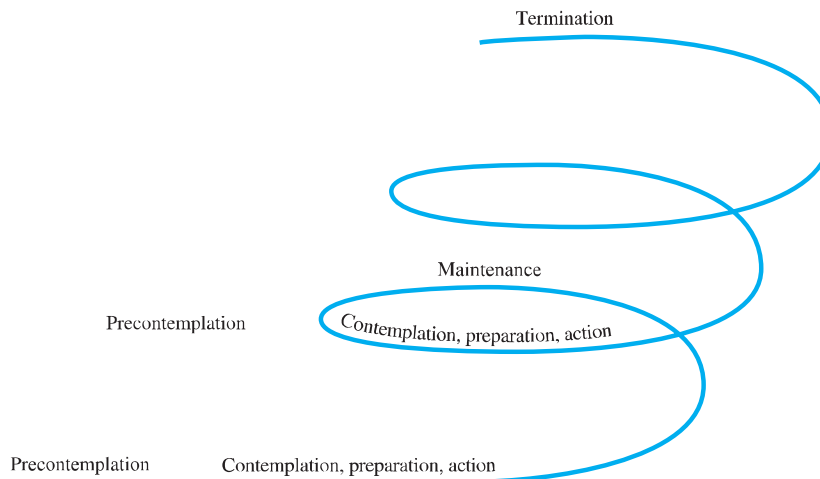
Using the Stage Model of Change

At each stage, particular types of interventions may be most appropriate. Specifically, providing people in the precontemplation stage with information about

Readiness to change a health habit is a prerequisite to health habit change.
© Getty Images RF

FIGURE 3.6 | A Spiral Model of the Stages of Change (*Source:* Prochaska et al., 1992)

their problem may move them to the contemplation phase. To move people from the contemplation phase into preparation, an appropriate intervention may induce them to assess how they feel and think about the problem and how stopping it will change them. Interventions designed to get people to make explicit commitments as to when and how they will change their behavior may bridge the gap between preparation and action. Interventions that emphasize providing self reinforcement, social support, stimulus control, and coping skills should be most successful with individuals moving through the action phase into long-term maintenance. The transtheoretical model has also been used to modify multiple health behaviors simultaneously (Johnson et al., 2014).

Perceived Barriers   **Perceived barriers** are aspects of one's life that interfere with practicing good health behaviors. The person with two jobs may not have enough time to sleep 7–8 hours. A woman who wants to exercise may perceive her neighborhood to be too unsafe for walking or running. A family without health insurance may not vaccinate their children.

Perceived barriers are a main reason why people don't practice good health behaviors (Gerend, Shepherd, & Shepherd, 2013), and it can be hard to help people overcome them. In the case of health insurance, social engineering has stepped in, requiring people to have insurance and to vaccinate their children. For the woman who wants to exercise, driving to or getting off a bus where there is a park with other people walking or running may solve the safety issue.

Lack of time, stress, competing goals, and inaccessibility of the health care system may be almost inevitable for some people (Gerend et al., 2013; Presseau, Tait, Johnston, Francis, & Sniehotta, 2013). But breaking down perceived barriers is paramount to getting people to practice good health behaviors.

■ CHANGING HEALTH BEHAVIORS THROUGH SOCIAL ENGINEERING

Much health behavior change occurs not through programs such as CBT interventions, but through **social engineering.** Social engineering modifies the environment in ways that affect people's abilities to practice a particular health behavior. Often, social engineering solutions are legally mandated. Some examples include requiring vaccinations for school entry, which has led to 90 percent of children in the United States receiving most of the vaccinations they need (Center for the Advancement of Health, December, 2002). Others include banning certain drugs, such as heroin and cocaine, and controlling the disposal of toxic wastes. Still others include taxation that may reduce, although not eliminate, poor health habits such as consumption of sugared soft drinks (*The Economist,* November 28, 2015).

Social engineering solutions to health problems can be more successful than individual behavior modification. For example, lowering the speed limit has had more impact on death and disability than interventions to get people to change their driving habits. Raising the legal drinking age and banning smoking

in the workplace have had major effects on these health problems. Controlling what is contained in vending machines at school and controlling advertisement of high fat and high cholesterol products to children may help to reduce the obesity epidemic.

Still, most health behavior change cannot be legally mandated, and people will continue to engage in bad habits even when their freedoms to do so are limited by social engineering. Consequently, health psychology interventions have a very important role in health behavior change.

■ VENUES FOR HEALTH-HABIT MODIFICATION

What is the best venue for changing health habits? There are several possibilities:

The Practitioner's Office

Many people have regular contact with a physician or other health care professional who knows their medical history and can help them modify their health habits. Physicians are highly credible sources for instituting health habit change, and their recommendations have the force of expertise behind them.

Some health-habit modification is conducted by psychologists and other health practitioners privately on a one-to-one basis, usually using cognitive-behavioral techniques. This approach has two advantages. First, the individual treatment a person receives makes success more likely, and second, the intervention can be tailored to the needs of the particular person. However, only one person's behavior can be changed at a time.

Nonetheless, the one-to-one approach reduces only one person's risk at a time. Managed care facilities sometimes run clinics to help people stop smoking, change their diet, and make other healthy lifestyle changes. Advantages are that a number of people can be reached simultaneously, and there is a direct link from knowledge of a person's health risks to the type of intervention that person receives.

The Family

Increasingly, health practitioners intervene with families to improve health (Fisher et al., 1998). People from intact families have better health habits than those who live alone or in fractured families. Families typically have more organized, routinized lifestyles than single people do, so family life can be suited to building in healthy behaviors, such as eating three meals a day, sleeping eight hours each night, and brushing teeth twice daily.

Children learn their health habits from their parents, so committing the entire family to a healthy lifestyle gives children the best chance at a healthy start in life. Multiple family members are affected by any one member's health habits, and so modifying one family member's behavior, such as diet, is likely to affect other family members.

A stable family life is health promoting, and interventions are increasingly being targeted to families rather than individuals to ensure the greatest likelihood of behavior change.

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Finally, and most important, if behavior change is introduced at the family level, all family members are on board, ensuring greater commitment to the behavior-change program and providing social support for the person whose behavior is the target.

Family interventions may be especially helpful in cultures that place a strong emphasis on family. Latinos, Blacks, Asians, and southern Europeans may be especially persuaded by health interventions that emphasize the good of the family (Han & Shavitt, 1994; Klonoff & Landrine, 1999).

Self-Help Groups

Millions of people in the United States modify their health habits through self-help groups. Self-help groups bring together people with the same health habit problem, and often with the help of a counselor, they attempt to solve their problem together. Some prominent self-help groups include Overeaters Anonymous and TOPS (Take Off Pounds Sensibly) for obesity, Alcoholics Anonymous for alcoholics, and Smokenders for smokers. Many group leaders employ cognitive-behavioral principles in their programs. The social support provided in these groups also contributes to their success. At the present time, self-help groups constitute the major venue for health-habit modification in the United States.

Schools

Interventions to encourage good health behaviors can be implemented through the school system (Facts of Life, November 2003). The school population is young, and consequently, we may be able to intervene before children have developed poor health habits. Schools have a natural intervention vehicle, namely, classes of approximately an hour's duration, and many health interventions can fit into this format. Moreover, interventions can change the social climate in a school regarding particular health habits in ways that foster behavior change.

Even in college, social networks continue to be good targets for health interventions. As one or two people change their behavior, their friends may begin to do so as well.

Workplace Interventions

Approximately 60 percent of the adult population is employed, and consequently, the workplace can reach much of this population (Bureau of Labor Statistics, 2012). Workplace interventions include on-the-job health promotion programs that help employees stop smoking, reduce stress, change their diet, exercise regularly, lose weight, control hypertension, and limit drinking, among other problems. Workplace interventions can be linked to those in other sites, for example, if the workplace frees up parents to participate in school interventions with their children (Anderson, Symoniak, & Epstein, 2014). Some workplaces provide health clubs, restaurants that serve healthy foods, and gyms that underscore the importance of good health habits (Figure 3.7). On the whole, workplace interventions have benefits, including higher morale, greater productivity, and reduced health care costs to organizations (Berry, Mirabito, & Baun, 2010).

Community-Based Interventions

There are many kinds of community interventions. A community-based intervention could be a door-to-door campaign about a breast cancer screening program, a media blitz alerting people to the risks of smoking, a grassroots community program to encourage exercise, a dietary modification program that recruits through community institutions, or a mixed intervention involving both media and personal contact.

There are several advantages of community-based interventions. First, such interventions reach more people than individually based interventions or interventions in limited environments, such as a single workplace or classroom. Second, community-based interventions can build on social support for reinforcing adherence to recommended health changes. For example, if all your neighbors have agreed to switch to a low-cholesterol diet, you are more likely to do so as well. Finally, much evidence already shows that neighborhoods can have profound effects on health practices, especially those of adolescents. Monitoring behavior within neighborhoods has been tied to a lower rate of smoking and alcohol abuse among adolescents, for example (Chuang, Ennett, Bauman, & Foshee, 2005).

But community interventions can be expensive and bring about only modest behavior change (Leventhal, Weinman, Leventhal, & Phillips, 2008). Partnering with existing community organizations such as health maintenance organizations may sustain gains from an initial community intervention and reduce costs.

FIGURE 3.7 | Percentage of Companies Offering a Particular Wellness Program to Their Employees, by Firm Size, 2011
(*Source:* Kaiser Family Foundation and Health Research and Education Trust, "Employer Health Benefits: Annual Survey 2011," September 27, 2011)
Note: "Small firms" are those with 3–199 workers; "large firms" are those with 200 or more workers.
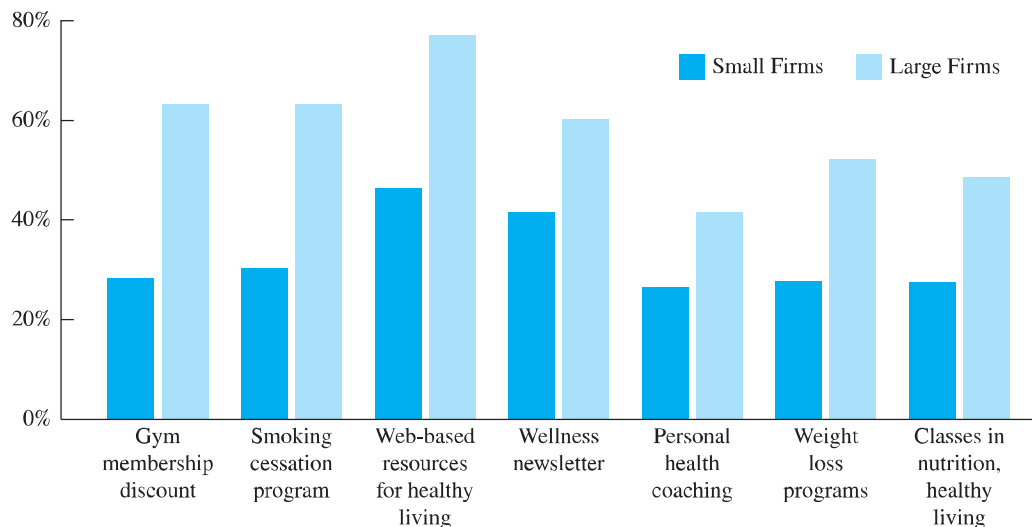
The Mass Media

A goal of health promotion is to reach as many people as possible, and consequently, the mass media have great potential. Generally, mass media campaigns bring about modest attitude change but less long-term behavior change. Nonetheless, the mass media can alert people to health risks that they would not otherwise know about.

Recently, health psychologists have studied the effects of health behaviors of characters in soap operas, dramas, and comedies. Characters who smoke, for example, can act as role models, increasing the likelihood that adolescents will begin to smoke (Heatherton & Sargent, 2009). By contrast, characters who engage in healthy activities can encourage healthy behavior change in their viewers.

By presenting a consistent media message over time, the mass media can also have a cumulative effect in changing the values associated with health practices. For example, the cumulative effects of anti-smoking mass media messages on social norms about smoking have been substantial.

Cellular Phones and Landlines

Venues for low-cost interventions include cell phones and landlines (Eakin, Reeves, Winkler, Lawler, & Owen, 2010). For example, automated phone interventions can prompt people to maintain health behavior change (Kaplan & Stone, 2013; King et al., 2014). Personalized text messages can help smokers quit (Rodgers et al., 2005), and so texting represents another potentially effective low-cost intervention. Programs to contact older adults by telephone each day can make sure their needs are being met, and recent efforts have incorporated lifestyle advice into these volunteer programs, such as recommending physical activity (Castro, Pruitt, Buman, & King, 2011). Moreover, such daily contact can also increase the older adult's experience of social support.

The Internet

The Internet provides information and low-cost access to health interventions for millions of people (Cohen & Adams, 2011). Websites for smoking cessation (Wang & Etter, 2004) and other health habits have been developed (Linke, Murray, Butler, & Wallace, 2007), and Internet-delivered, computer-tailored lifestyle interventions targeting multiple risk factors simultaneously, for example, diet, exercise, and smoking, have shown some success (Oenema, Brug, Dijkstra, de Weerdt, & de Vries, 2008). The Internet can also be used to augment the effectiveness of other interventions, such as school-based smoking cessation programs (Norman, Maley, Skinner, & Li, 2008) or interventions with patient groups (Williams, Lynch, & Glasgow, 2007). Tailored e-coaching that provides

To reach the largest number of people most effectively, researchers are increasingly designing interventions to be implemented on a community basis through existing community resources.

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individualized feedback can supplement standardized interventions for health-related behavior change, such as weight loss (Gabriele, Carpenter, Tate, & Fisher, 2011).

CBT interventions for health habit modification delivered via the Internet can be as effective as face-to-face interventions, and they have advantages of low cost, saving therapists' time, reducing waitlist and travel time, and providing interventions to people who might not seek out a therapist on their own (Cuijpers, van Straten, & Andersson, 2008; Mohr et al., 2010). The Internet also enables researchers to recruit a large number of participants for studies at relatively low cost, thus enabling data collection related to health habits (Lenert & Skoczen, 2002).

The choice of venue for health-habit change is an important issue. Understanding the particular strengths and disadvantages of each venue helps to define interventions that can reach the most people for the least expense. •

SUMMARY

1. Health promotion enables people to increase control over and improve their health. It involves the practice of good health behaviors and the avoidance of health-compromising ones.

2. Health habits are determined by demographic factors (such as age and SES), social factors (such as early socialization in the family), values and cultural background, perceived symptoms, access to medical care, and cognitive factors (such as health beliefs). Health habits are only modestly related to each other and are highly unstable over time.

3. Health-promotion efforts target children and adolescents before bad health habits are in place. They also focus on people at risk for disorders to prevent those disorders from occurring. A focus on health promotion among older adults may help contain the soaring costs of health care late in life.

4. Research based on the health belief model and the theory of planned behavior have identified attitudes related to health-habit modification, including the belief that a threat to health is severe, that one is personally vulnerable to the threat, that one is able to perform the response needed to reduce the threat (self efficacy), that the response will be effective in overcoming the threat (response efficacy), and that social norms support one's practice of the behavior.

5. Attitudinal approaches to health behavior change can instill knowledge and motivation. But by themselves, approaches such as fear appeals and information appeals can have limited effects on behavior change.

6. Cognitive-behavioral approaches to health-habit change use principles of self monitoring, classical conditioning, operant conditioning, modeling, and stimulus control to modify the antecedents and consequences of a target behavior. CBT brings clients into the treatment process by drawing on principles of self control and self reinforcement.

7. Social skills training and relaxation training methods can be incorporated into cognitive-behavioral interventions to deal with the anxiety or social deficits that underlie some health problems.

8. Increasingly, interventions focus on relapse prevention. Practicing coping techniques for managing high-risk-for-relapse situations is a major component of such interventions.

9. Successful modification of health habits does not occur all at once. People go through stages, which they may cycle through several times. When interventions are targeted to the stage an individual is in, they may be more successful.

10. Some health habits are best changed through social engineering, such as mandated childhood immunizations or smoking bans in the workplace.

11. The venue for intervening in health habits is changing. Expensive methods that reach one individual at a time are giving way to group methods that are cheaper, including self help groups, and school and workplace interventions. The mass media can reinforce health campaigns by alerting people to health risks. Telephone interventions, Internet interventions, and texting all show promise as health behavior change venues.

KEY TERMS

abstinence violation effect
assertiveness training
at risk
behavioral assignments
classical conditioning
cognitive-behavior therapy (CBT)
cognitive restructuring
contingency contracting
discriminative stimulus
fear appeals
health behaviors
health belief model
health habit

health locus of control
health promotion
lifestyle rebalancing
modeling
operant conditioning
primary prevention
relapse prevention
relaxation training
self control
self determination theory (SDT)
self efficacy
self monitoring
self regulation

self reinforcement
self talk
social engineering
social skills training
socialization
stimulus-control interventions
teachable moment
theory of planned behavior
transtheoretical model of behavior change
window of vulnerability