

Health-Promoting Behaviors



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CHAPTER OUTLINE

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Chapter 4 examines how the principles described in Chapter 3 apply to health-promoting behaviors, including exercise, accident prevention, cancer prevention, healthy diet, and sleep. Each of these important behaviors has been related to at least one major cause of illness and death in industrialized countries. As people in third-world countries adopt the lifestyles of industrialized nations, these health habits will assume increasing importance throughout the world.

■ EXERCISE

A recent headline reads, “Sedentary behavior trumps fat as a killer” (Healy, 2015). In fact, a recent review of 47 studies found that the risk of several chronic diseases and early death increases with long periods of sitting (Alter et al., 2015); even taking breaks from sitting does not fully offset the risk. Adequate physical fitness among adolescents is only 42%, with girls worse than boys (Gahche et al., 2014). Consequently, a high level of physical activity is an important health behavior.

Exercise helps to maintain mental and physical health. At one time, scientists believed that only **aerobic exercise** has health benefits, but now evidence suggests that any kind of exercise has benefits, especially for middle-aged and older adults.

Benefits of Exercise

The health benefits of exercise are substantial. A mere 30 minutes of exercise a day can decrease the risk of several chronic diseases, including heart disease, diabetes, and some cancers. Exercise accelerates wound

healing in those with injuries (Emery, Kiecolt-Glaser, Glaser, Malarkey, & Frid, 2005), and can be critical to recovery from disabilities, such as hip fracture (Resnick et al., 2007). Other health benefits are listed in Table 4.1.

However, over two-thirds of American adults do not engage in the recommended levels of physical activity, and about two-thirds of American adults do not engage in any regular leisure-time physical activity (National Center for Health Statistics, 2011). Physical activity is more common among men than women, among Whites than African-Americans and Hispanics, among younger than older adults, and among those with higher versus lower incomes (National Center for Health Statistics, 2011b).

How Much Exercise? The typical exercise prescription for a normal adult is 30 minutes or more of moderate-intensity activity on most or all days of the week or 20 minutes or more of vigorous or aerobic activity at least 3 days a week (U.S. Department of Health and Human Services, 2009). Aerobic exercise is marked by high intensity, long duration, and the need for endurance, and it includes running, bicycling, rope jumping, and swimming. A person with low cardiopulmonary fitness may derive benefits from even less exercise each week. Even short walks or just increasing activity level has physical and psychological benefits for older adults (Ekkekakis, Hall, VanLanduyt, & Petruzzello, 2000; Schechtman, Ory, & the FICSIT group, 2001).

Effects on Psychological Health Regular exercise improves not only physical health but also mood and emotional well-being (Gallegos-Carrillo et al., 2013; Maher et al., 2013). Many people seem to be unaware of these hidden benefits of exercise (Ruby, Dunn, Perrino, Gillis, & Viel, 2011). Some of the positive effects of exercise on mood may stem from factors associated with exercise, such as social activity or being outside (Dunton, Liao, Intille, Huh, & Leventhal, 2015). An improved sense of self-efficacy can also underlie some of the mood effects of exercise (McAuley et al., 2008).

Because of its beneficial effects on mood and self-esteem, exercise has even been used as a treatment for depression (Herman et al., 2002). Several interventions have now shown that exercise can prevent depression in women (Babyak et al., 2000; Wang et al., 2011), and stopping exercise can lead to an increase in symptoms of depression (Berlin, Kop, & Deuster, 2006).

Health psychologists have also found beneficial effects of exercise on cognitive functioning, especially

TABLE 4.1 | Health Benefits of Regular Exercise

- Helps you control your weight
- Reduces your risk of cardiovascular disease
- Reduces your risk for Type II diabetes and metabolic syndrome
- Reduces your risk of some cancers
- Strengthens your bones and muscles
- Decreases resting heart rate and blood pressure and increases strength and efficiency of heart
- Improves sleep
- Increases HDL (good) cholesterol
- Improves immune system functioning
- Promotes the growth of new neurons in the brain
- Promotes cognitive functioning

Sources: Centers for Disease Control and Prevention, February, 2011; Hamer & Steptoe, 2007; Heisz & Vander Morris, Wu, McIntosh, & Ryan, 2015.



Regular aerobic exercise produces many physical and emotional benefits, including reduced risk for cardiovascular disease.

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on executive functioning involved in planning and higher-order reasoning (Heisz & Vandermorris, Wu, McIntosh, & Ryan, 2015). Exercise appears to promote memory and healthy cognitive aging (Erickson et al., 2011; Pereira et al., 2007) and may improve cognitive functioning and executive control in children as well (Heisz & Vandermorris, Wu, McIntosh, & Ryan, 2015). Even modest exercise or increases in activity level can have these beneficial effects on cognitive functioning.

Exercise may offer economic benefits as well. Employee fitness programs can reduce absenteeism, increase job satisfaction, and reduce health care costs, especially among women employees (Rodin & Plante, 1989).

Determinants of Regular Exercise

Most people's participation in exercise is erratic. Starting young, even in preschool, is important

(Gagné & Harnois, 2013) as even very young children start watching TV and using tablets and computers early in life. Currently, only about half of youth meet physical activity requirements of 60 minutes a day (Institute of Medicine, 2013). Children get regular exercise through required physical education classes in school, but even these classes have faced budget cutbacks. Moreover, by adolescence, the practice of regular exercise has declined substantially, especially among girls (Davison, Schmalz, & Downs, 2010) and among boys not involved in formal athletics (Crosnoe, 2002). Adults report lack of time, stress, interference with daily activities, and fatigue as barriers to obtaining exercise (Kowal & Fortier, 2007).

Who Exercises? People who come from families in which exercise is practiced, who have positive attitudes toward physical activity, who have a strong sense of self-efficacy for exercising (Peterson, Lawman, Wilson, Fairchild, & Van Horn, 2013), who have energy, and who are extroverted and sociable (Kern, Reynolds, & Friedman, 2010) are more likely to exercise. People who perceive themselves as athletic or as the type of person who exercises (Salmon, Owen, Crawford, Bauman, & Sallis, 2003), who have social support from friends to exercise (Marquez & McAuley, 2006), who enjoy their form of exercise (Kiviniemi, Voss-Humke, & Seifert, 2007), and who believe that people should take responsibility for their health are also more likely to get exercise than people who do not have these attitudes.

Characteristics of the Setting Convenient and easily accessible exercise settings promote exercise (Gay, Saunders, & Dowda, 2011). Vigorous walking in your neighborhood can be maintained more easily than participation in an aerobics class in a crowded health club 5 miles from your home. Lack of safe places to do exercise is a particular barrier for people who live in low socioeconomic status neighborhoods (Estabrooks, Lee, & Gyurcsik, 2003; Feldman & Steptoe, 2004).

Improving environmental options for exercise, such as walking trails and recreational facilities, increases rates of exercise (Siceloff, Coulon, & Wilson, 2014). When people believe their neighborhoods are safe, when they are not socially isolated, and when they know what exercise opportunities are available to them in their area, they are more likely to engage in physical activity (Hawkey, Thisted, & Cacioppo, 2009; Sallis, King, Sirard, & Albright, 2007; van Stralen, de Vries, Bolman, Mudde, & Lechner, 2010).

Social support can foster exercise. Making a commitment to another person to meet for exercise increases the likelihood that it will happen (Prestwich et al., 2012). People who participate in group exercise programs such as jogging or walking say that social support and group cohesion are two of the reasons why they participate (Floyd & Moyer, 2010). This support may be especially important for exercise participation among Hispanics (Marquez & McAuley, 2006). Even just seeing others engaging in exercise around one's neighborhood or on a running path can increase how much time a person puts into exercise (Kowal & Fortier, 2007).

The best predictor of regular exercise is regular exercise (Phillips & Gardner, 2016). Long-term practice of regular exercise is heavily determined by habit (McAuley, 1992). The first 3–6 months appear to be critical, and people who will drop out usually do so in that time period (Dishman, 1982). Developing a regular exercise program, embedding it in regular activities, and doing it regularly means that it begins to become automatic and habitual. However, habit has its limits. Unlike such habitual behaviors as wearing a seat belt or brushing teeth, exercise takes willpower and a belief in personal responsibility in order to be enacted on a regular basis. In summary, if people participate in activities that they like, that are convenient, that they are motivated to pursue, and for which they can develop goals, exercise adherence will be greater (Papandonatos et al., 2012).

Exercise Interventions

Several types of interventions have shown success in getting people to exercise. Interventions that incorporate principles of self-control (enhancing beliefs in personal efficacy) and that muster motivation can be successful in changing exercise habits (Conroy, Hyde, Doerksen, & Riebeiro, 2010). Helping people to form implementation intentions, and following up with brief text messages can promote activity as well (Prestwich, Perugini, & Hurling, 2010). Several studies confirm the usefulness of the transtheoretical model of behavioral change (that is, the stages of change model) for increasing physical activity. Interventions designed to increase and maintain physical activity that are matched to stage of readiness are more successful than interventions that are not (Blissmer & McAuley, 2002; Dishman, Vandenberg, Motl, & Nigg, 2010; Marshall et al., 2003). When an exercise intervention promotes personal values, such

as regaining fitness, it can be especially successful (Hunt, McCann, Gray, Mutrie, & Wyke, 2013).

As is true with other health behaviors, factors that affect the adoption of exercise are not necessarily the same as those that predict long-term maintenance of an exercise program. Believing that physical activity is important predicts initiation of an exercise program, whereas barriers, such as no time or few places to get exercise, predict maintenance (Rhodes, Plotnikoff, & Courneya, 2008). Self efficacy about one's ability to overcome barriers is a predictor of maintenance (Higgins, Middleton, Winner, & Janelle, 2014).

Family-based interventions designed to induce all family members to be more active have shown some success (Rhodes, Naylor, & McKay, 2010). Worksites interventions to promote exercise have small but positive effects on increased physical activity (Abraham & Graham-Rowe, 2009). Even minimal interventions such as sending mailers encouraging physical exercise to older adults can increase exercise. Text messaging also shows success in promoting exercise such as brisk walking (Prestwich, Perugini, & Hurling, 2010). The advantages of these interventions, of course, are low cost and ease of implementation.

Relapse prevention techniques increase long-term adherence to exercise programs. For example, helping people figure out how to overcome barriers to obtaining regular exercise, such as stress, fatigue, and a hectic schedule, improves adherence (Blanchard et al., 2007; Fjeldsoe, Miller, & Marshall, 2012).

Incorporating exercise into a more general program of healthy lifestyle change can be beneficial as well. Motivation to engage in one health behavior can spill over into another (Mata et al., 2009). For example, among adults at risk for coronary heart disease (CHD), brief behavioral counseling matched to stage of readiness helped them maintain physical activity, as well as reduce smoking and fat intake (Steptoe, Kerry, Rink, & Hilton, 2001). Setting personal goals for exercise can improve commitment (Hall et al., 2010), and forming explicit implementation intentions regarding exactly when and how to exercise facilitates practice as well; planning when to exercise can facilitate the link between intention and actual behavior (Conner, Sandberg, & Norman, 2010).

Exercise interventions may promote more general lifestyle changes. This issue was studied in an intriguing manner with 60 Hispanic and Anglo families, half of whom had participated in a 1-year intervention program of dietary modification and exercise. All the families

were taken to the San Diego Zoo as a reward for participating in the program, and while they were there, their food intake and amount of walking were recorded. Families that had participated in the intervention consumed fewer calories, ate less sodium, and walked more than the families in the control condition, suggesting that the intervention had been integrated into their lifestyle (Patterson et al., 1988). The family-based approach of this intervention may have contributed to its success as well (Martinez, Ainsworth, & Elder, 2008).

Physical activity websites would seem to hold promise for inducing people to participate in regular exercise (Napolitano et al., 2003). Of course, if one is on the Internet, one is by definition not exercising. Indeed, thus far, the evidence is mixed that physical activity websites provide the kind of individually tailored recommendations that are needed to get people to exercise on a regular basis (Carr et al., 2012) and initial gains may not be maintained (Carr et al., 2013). However, automated exercise advice can help maintain a physical activity program, once it is initiated (King et al., 2014).

Despite the problems health psychologists have encountered in getting people to exercise and to do so faithfully, the exercise level in the U.S. population has increased substantially in recent decades. A physician's recommendation is one of the factors that lead people to increase their exercise, and trends show that physicians increasingly are advising their patients to begin or continue exercise (Barnes & Schoenborn, 2012). The number of people who participate in regular exercise has increased by more than 50 percent in the past few decades. Increasingly, it is not just sedentary healthy adults who are becoming involved in exercise but also the elderly and chronically ill patients (Courneya & Friedenreich, 2001). These findings suggest that, although the population may be aging, it may be doing so in a healthier way than was true in recent past generations.

■ ACCIDENT PREVENTION

No wonder that so many cars collide;
Their drivers are accident prone,
When one hand is holding a coffee cup,
And the other a cellular phone.

—Art Buck

This rhyme captures an important point. Accidents represent one of the major causes of preventable death, both worldwide and in the United States. Moreover, this cause of death is increasing. Worldwide, nearly 1.3 million people die as a result of road traffic injuries, and the estimated economic cost of accidents

is \$518 billion per year (World Health Organization, 2009). Nationally, bicycle accidents cause more than 900 deaths per year, prompt more than 494,000 emergency room visits, and constitute the major cause of head injury, making helmet use an important issue (Centers for Disease Control and Prevention, 2015). Over 2,000 people a day are accidentally poisoned in the United States, usually by prescription or illegal drugs, and more than 40,000 people die of poisoning each year (Centers for Disease Control and Prevention, March 2012a; Warner, Chen, Makuc, Anderson, & Miniño, 2011). Occupational accidents and their resulting disability are a particular health risk for working men.

Home and Workplace Accidents

Accidents in the home, such as accidental poisonings and falls, are the most common causes of death and disability among children under age 5 (Barton & Schwebel, 2007). Interventions to reduce home accidents are typically conducted with parents because they have control over the child's environment. Putting safety catches and gates in the home, placing poisons out of reach, and teaching children safety skills are components of these interventions.

Pediatricians and their staff often incorporate such training into visits with new parents (Roberts & Turner, 1984). Parenting classes help parents to identify the most common poisons in the home and to keep these away from young children. Evaluations of interventions that train parents how to childproof a home (Morrongiello, Sandomierski, Zdzieborski, & McCollam, 2012) show that such interventions can be successful. Even young children can learn about safety in the home. For example, an intervention using a computer game (The Great Escape) improved children's knowledge of fire safety behaviors (Morrongiello, Schwebel, Bell, Stewart, & Davis, 2012). Virtual environmental training on websites can help children learn to cross the street safely (Schwebel, McClure, & Severson, 2014).

At one time, workplace accidents were a primary cause of death and disability. However, statistics suggest that overall, accidents in the workplace have declined since the 1930s. This decline may be due, in part, to better safety precautions by employers. However, accidents at home have actually increased. Social engineering solutions, such as safety caps on medications and required smoke detectors in the home, have mitigated the increase, but the trend is worrisome.

Accidents and Older Adults More than 12,800 older adults die each year of fall-related injuries, and



Automobile accidents represent a major cause of death, especially among the young. Legislation requiring child safety restraint devices has reduced fatalities dramatically.

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many more are disabled. At least 25 percent of older adults may remain hospitalized for at least a year due to injuries from a fall (Facts of Life, March 2006).

Consequently, strategies to reduce accidents among older adults have increasingly been a focus of health psychology research and interventions. Dietary and medication intervention to reduce bone loss can affect risk of fracture. Physical activity training involving balance, mobility, and gait training reduces the risk of falls. Teaching older adults to make small changes in their homes that reduce tripping hazards can help, including nonslip bathmats, shower grab bars, hand rails on both sides of stairs, and better lighting (Facts of Life, March 2006). The evidence suggests that fall prevention programs, often led by health psychologists, can reduce mortality and disability among older adults substantially (Facts of Life, March 2006).

Motorcycle and Automobile Accidents

You know what I call a motorcyclist who doesn't wear a helmet? An organ donor.

—Emergency room physician

The single greatest cause of accidental death is motorcycle and automobile accidents (Centers for Disease Control and Prevention, 2009a). Although social engineering solutions such as speed limits and seat belts have major effects on accident rates, psychological interventions can also address factors associated with

accidents. These include the way people drive, the speed at which they drive, and the use of preventive measures to increase safety, such as interventions to reduce cell phone usage while driving (Weller, Shackelford, Dieckmann, & Slovic, 2013).

For example, many Americans still do not use seat belts, a problem especially common among adolescents, which accounts, in part, for their high rate of fatal accidents (Facts of Life, May 2004). Community-wide health education programs aimed at increasing seat belt usage and infant restraint devices can be successful. One such program increased the use from 24 to 41 percent, leveling off at 36 percent over a 6-month follow-up period (Gemming, Runyan, Hunter, & Campbell, 1984).

On the whole, though, social engineering solutions may be more effective. Seat belt use is more prevalent in states with laws that mandate their use, and states that enforce helmet laws for motorcycle riders have reduced deaths and lower health care costs related to disability due to motorcycle accidents (*Wall Street Journal*, 2005, August 9).

■ VACCINATIONS AND SCREENING

Vaccinations and screening represent two ways of avoiding or detecting early some of the main causes of death in the United States. Yet many people fail to use these health resources, which makes behavior change important for health psychologists.

Vaccinations

Parents are urged to get their children vaccinated against measles, polio, diphtheria, whooping cough, and tetanus, among other childhood diseases. Most do, because school registration typically requires these vaccines. However, some do not and instead are freeriders; that is, if most children are vaccinated, the minority that is not are protected by those who are (Betsch, Böhm, & Korn, 2013). In some cases, refusing to get vaccinations for one's children comes from the mistaken beliefs that a vaccine actually causes the disease or that the vaccine causes another disorder, such as autism. Interventions have attempted to correct the incorrect beliefs that can undermine vaccination and stressed the social benefits of vaccination in the hopes of keeping rates high (Betsch et al., 2013).

Vaccinations of girls and boys against HPV (human papillomavirus) by age 13 is now recommended by the National Institutes of Health. HPV is a sexually transmitted virus tied to cervical as well as other cancers. The Centers for Disease Control and Prevention report, however, that as of 2016, only 40% of girls and 21% of boys had received it. This rate compares very unfavorably to many other countries, including Australia (75%), the United Kingdom (about 88%) and Rwanda (93%) (Winslow, 2016). Family-focused messages aimed at parents and adolescents have been suggested as one focus of public health interventions to increase vaccination rates (Alexander et al., 2014), and direct payments to adolescents in the UK have been tried (Mantzari, Vogt, & Marteau, 2015). As yet, the most effective way to encourage this behavior has not been found.

Screenings

The two most common cancers in the United States are breast cancer in women and prostate cancer in men. Until recently, routine screening was the frontline against these cancers. At present, however, routine screening through mammography for women and the PSA (prostate-specific antigen) test for men is no longer recommended for all adults; false positives (when the test falsely suggests the presence of cancer) has led to unnecessary treatment, including surgeries. Moreover, although diagnosed cases from both tests increased, there has been little to no impact on mortality from these causes.

At present, men who are symptomatic or at high risk (who have a family history of prostate cancer; Watts et al., 2014) and women who are symptomatic or at high risk (having a family history of breast



Mammograms are an important way of detecting breast cancer in women over 50. Finding ways to reach older women to ensure that they obtain mammograms is a high priority for health scientists.

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cancer; having genes implicated in breast cancer) should be monitored. Otherwise, routine PSA screening is not recommended and a mammogram is recommended every year between ages 45 and 55 and every other year for women between the ages of 55 and 74. In older women, the value of the test is less clear.

Why is screening through mammography important for high-risk women? The reasons are several:

- One in every eight women in the United States develops breast cancer.
- The majority of breast cancers are detected in women over age 40, and so screening this age group is cost effective.
- Early detection, as through mammograms, can improve survival rates.

Unfortunately, compliance with mammography recommendations is low. Fear of radiation, embarrassment over the procedure, anticipated pain, anxiety, fear

of cancer (Gurevich et al., 2004; Schwartz, Taylor, & Willard, 2003), and, most importantly, especially among poorer women, concern over costs act as deterrents to getting regular mammograms (Lantz, Weigers, & House, 1997). Lack of awareness of the importance of mammograms, little time, and lack of available services also contribute to low screening rates.

Changing attitudes toward mammography can increase the likelihood of obtaining a mammogram. For example, the theory of planned behavior predicts the likelihood of obtaining regular mammograms: Women who have positive attitudes regarding mammography and who perceive social norms as favoring their obtaining a mammogram are more likely to participate in a mammography program (Montano & Taplin, 1991). Social support predicts use of mammograms and may be especially important for low-income and older women (Messina et al., 2004). If your friends are getting mammograms, you are more likely to do so as well. Interventions are more successful if they are geared to the stage of readiness of prospective participants (Champion & Springston, 1999; Lauver, Henriques, Settersten, & Bumann, 2003).

Colorectal Cancer Screening

In Western countries, colorectal cancer is the second-leading cause of cancer deaths. In recent years, medical guidelines have recommended routine colorectal screening for older adults (Wardle, Williamson, McCaffery et al., 2003).

Factors that predict the practice of other health behaviors also predict participation in colorectal cancer screening, including self-efficacy, perceived benefits of the procedure, a physician's recommendation to participate, social norms favoring participation, and few barriers to taking advantage of a screening program (Hays et al., 2003; Manne et al., 2002; Sieverding, Matteredne, & Ciccarello, 2010). As is true of many health behaviors, beliefs predict the intention to participate in colorectal screening, whereas life difficulties (low SES, poor health status) interfere with actually getting screened (Power et al., 2008).

Community-based programs that use the mass media, community-based education, interventions through social networks such as churches, health care provider recommendations, and reminder notices promote participation in cancer screening programs and can attract older adults (Campbell et al., 2004; Curbow et al., 2004). Telephone-based interventions tailored

to people's resistance to colorectal screening can increase the likelihood of obtaining screening as well (Menon et al., 2011). Hispanics are at particular risk for colorectal cancer, and so it is especially important to reach them (Gorin, 2005).

■ SUN SAFETY PRACTICES

The past 30 years have seen a nearly fourfold increase in the incidence of skin cancer in the United States. Although basal cell and squamous cell carcinomas do not typically kill, malignant melanoma takes over 9,000 lives each year (Centers for Disease Control and Prevention, August 2015). In the past two decades, melanoma incidence has risen by 155 percent. Moreover, these cancers are among the most preventable. The chief risk factor for skin cancer is well known: excessive exposure to ultraviolet (UV) radiation. Living or vacationing in southern latitudes, participating in outdoor activities, and using tanning salons all contribute to dangerous sun exposure. Less than one-third of American children adequately protect themselves against the sun, and more than three-quarters of American teens get at least one sunburn each summer (Facts of Life, July 2002).

As a result, health psychologists have developed interventions to promote safe sun practices. Typically, these efforts begin with educational interventions to alert people to the risks of skin cancer and to the effectiveness of sunscreen use for reducing risk (Lewis et al., 2005; Stapleton, Turrisi, Hillhouse, Robinson, & Abar, 2010). However, education alone is not entirely successful (Jones & Leary, 1994). Tans are still perceived to be attractive (Blashill, Williams, Grogan, & Clark-Carter, 2015), and many people are oblivious to the long-term consequences of tanning (Orbell & Kyriakaki, 2008). Many people use sunscreens with an inadequate sun protection factor (SPF), and few people apply sunscreen often enough during outdoor activities (Wichstrom, 1994). Effective sunscreen use requires knowledge about skin cancer, perceived need for sunscreen, perceived efficacy of sunscreen as protection against skin cancer, and social norms that favor sunscreen use (Stapleton, Turrisi, Hillhouse, Robinson, & Abar, 2010; Turrisi, Hillhouse, Gebert, & Grimes, 1999). All of these factors change only grudgingly.

Parents play an important role in ensuring that children reduce sun exposure (Turrisi, Hillhouse, Robinson, & Stapleton, 2007). Parents' own sun protection habits influence how attentive they are to their children's practices and what their children do when they are on their own (Turner & Mermelstein, 2005).



Despite the risks of exposure to the sun, millions of people each year continue to sunbathe.

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Communications to adolescents and young adults that stress the gains that sunscreen use will bring them, such as freedom from concern about skin cancers or improvements in appearance, may be more successful than those that emphasize the risks (Detweiler, Bedell, Salovey, Pronin, & Rothman, 1999; Jackson & Aiken, 2006). When risks are emphasized, it is important to stress the immediate adverse effects of rather than the long-term risks of chronic illness, because adolescents and young adults are especially influenced by immediate concerns.

In one clever investigation, one group of beachgoers were exposed to a photo-aging intervention that showed premature wrinkling and age spots; a second group received a photo intervention that made the negative appearance-related consequences of UV exposure very salient; a third group received both interventions; and a fourth group was assigned to a control condition. Those beachgoers who received the UV photo information engaged in more sun protective behaviors, and the combination of the UV photo with the photo-aging information led to substantially less sunbathing over the long-term (Mahler, Kulik, Gerrard, & Gibbons, 2007; Mahler, Kulik, Gibbons, Gerrard, & Harrell, 2003). Similar interventions appear to be effective in reducing the use of tanning salons (Gibbons, Gerrard, Lane, Mahler, & Kulik, 2005).

Health psychologists have explored Internet-based strategies as a vehicle for distributing sun safety materials. Responses have thus far been weak, suggesting that more personal and aggressive approaches may be

needed (Buller, Buller, & Kane, 2005). Nonetheless, even brief interventions directed to specific sun safety practices, such as decreasing indoor tanning, can be effective (Abar et al., 2010).

■ DEVELOPING A HEALTHY DIET

Diet is an important and controllable risk factor for many of the leading causes of death and disease. For example, diet is related to serum cholesterol level and to lipid profiles. The dramatic rise in obesity in the United States has added urgency to this issue. However, only about 13 percent of adults get the recommended servings of fruit and only about 9 percent get the recommended servings of vegetables each day (Centers for Disease Control and Prevention, July 2015; Table 4.2). Experts estimate that unhealthful eating contributes to more than 678,000 deaths per year (U.S. Burden of Disease Collaborators, 2013).

Dietary change is critical for people at risk for or already diagnosed with chronic diseases such as coronary artery disease, hypertension, diabetes, and cancer (Center for the Advancement of Health, 2000f). These are diseases for which people low in SES are more at risk, and diet may explain some of the relation between low SES and these disorders. For example, supermarkets in high-SES neighborhoods carry more health-oriented food products than do supermarkets in low-income areas. Thus, even if the motivation to change one's diet is there, the food products may not be (Conis, 2003, August 4).

TABLE 4.2 | Current USDA Recommendations for a Balanced Diet

The United States Agriculture Department currently recommends a 2,000-calorie-a-day diet made up of the following components:

–Dairy (3 cups)



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–Fruits (2 cups)



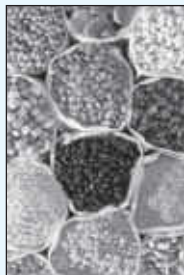
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–Vegetables (2.5 cups)



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–Grain (3 oz)



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–Meat (6 oz)



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–Oil (6 tsp)



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Switching from trans fats (as are used for fried and fast foods) and saturated fats (from meat and dairy products) to polyunsaturated fats and monounsaturated fats is a healthful change as well (Marsh, 2002, September 10). Current U.S. government guidelines for a balanced diet are described in Table 4.2.

Several specific diets, in addition to low-fat diets, have health benefits. Healthy “Mediterranean” diets are rich in vegetables, nuts, fruits, and fish and low in red meat. Low-carbohydrate diets with vegetarian sources of fat and protein and little bread and other high-carbohydrate foods can have healthful effects. Many people like these diets, and so they can be fairly easily adopted and adhered to over time.

Resistance to Modifying Diet

It is difficult to get people to modify their diet, however, even when they are at high risk for CHD or when their physician recommends it. The typical reason that people switch to a diet low in cholesterol, fats, calories, and additives and high in fiber, fruits, and vegetables is to improve appearance, not to improve health. Even so, fewer than half of U.S. adults meet the dietary recommendations for reducing fat levels and for increasing fiber, fruit, and vegetable consumption (Kumanyika et al., 2000).

Rates of adherence to a new diet may be high at first but fall off over time. Some diets are restrictive, monotonous, expensive, and hard to implement. Changes in shopping, meal planning, cooking methods, and eating habits may be required. In addition, tastes are hard to alter. Foods that are high in fat and sugars help turn off stress hormones, such as cortisol, but they contribute to an unhealthy diet (Dallman et al., 2003). A preference for meat, a lack of health consciousness, a limited interest in exploring new foods, and low awareness of the link between eating habits and illness are all tied to poor dietary habits.

Stress and Diet Stress has a direct and negative effect on diet. People under stress eat more fatty foods, fewer fruits and vegetables, and are more likely to snack and skip breakfast (O’Connor, Jones, Ferguson, Conner, & McMillan, 2008). People with low status jobs, high workloads, and little control at work also have less healthy diets. When people are under stress, they are distracted, may fail to practice self-control, and may not pay much attention to what they are eating (Devine, Connors, Sobal, & Bisogni, 2003). Thus, the sheer cognitive burden of daily life can interfere

Changing Diet

The good news is that changing one’s diet can improve health. A diet high in fruits, vegetables, with some whole grains, peas and beans, poultry, and fish and low in refined grains, potatoes, and red and processed meats lowers the risk of coronary heart disease (Fung, Willett, Stampfer, Manson, & Hu, 2001).

with the ability to control food consumption by preventing people from monitoring their eating (Ward & Mann, 2000).

Who Controls Their Diet? People who are high in conscientiousness and intelligence do a better job of adhering to a healthy diet. People who have high self-control are better able to manage a healthy diet than people without executive control skills (Hall, 2011). A strong sense of self-efficacy, knowledge about dietary issues, family support, and the perception that dietary change has important health benefits are also critical to developing a healthy diet (Step toe, Doherty, Kerry, Rink, & Hilton, 2000).

When people are informed about social norms regarding diet, they are more likely to make a change toward those norms (Robinson, Fleming, & Higgs, 2014). For example, if the people around you have stopped drinking soda because they think it is unhealthy, you are more likely to do so as well.

Interventions to Modify Diet Recent efforts to induce dietary change have focused heavily on reducing portion size, snacking, and sugary drink consumption. Portion size has increased greatly over the past decades, contributing to obesity. Snacking has also been tied to obesity. Sugary drinks have been tied to higher heart disease risk (de Koning et al., 2012) and are suspected of contributing to the rising rates of type 2 diabetes. Accordingly, interventions have been directed to these issues, as well as to reducing fat and increasing vegetable and fruit consumption. Specific health risks such as obesity, diabetes, or CHD often lead people to change their diets, and physicians, nurses, dieticians, and health psychologists work with patients to develop an appropriate diet.

Most diet change is implemented through cognitive-behavioral interventions. Efforts to change diet begin with education and training in self-monitoring: Most people are poorly informed about what a healthy diet is and do not pay sufficient attention to what they actually eat (O'Brien, Fries, & Bowen, 2000). Additional components are stimulus control, and contingency contracting, coupled with relapse prevention techniques for high-risk-for-relapse situations, such as parties. Drawing on social support for making a dietary change and increasing one's sense of self-efficacy are two critical factors for improving diet (Step toe, Perkins-Porras, Rink, Hilton, & Cappuccio, 2004). Self affirmation and motivational interviewing have

shown to be helpful in getting people to increase their fruit and vegetable intake and otherwise improve their diets (Ahluwalia et al., 2007; Harris et al., 2014). Training in self-regulation, including planning skills and formation of explicit behavioral intentions (Stadler, Oettingen, & Gollwitzer, 2010), can improve dietary adherence. Implementation intentions regarding exactly when, where, and what food will be consumed can also help people bring snacking under intentional control (Harris et al., 2014). However, much eating and snacking occurs mindlessly, when people are exerting little self-control. In such cases, simple environmental interventions, such as a sign in a cafe promoting healthy eating, can help people make good choices (Allan, Johnston, & Campbell, 2015).

Recent efforts to change the dietary habits of high-risk people have focused on the family (Gorin et al., 2013). Eating meals together promotes better eating habits. In family interventions, family members typically meet with a dietary counselor to discuss ways to change the family diet. When all family members are committed to and participate in dietary change, it is easier for a target family member (such as a cardiac patient) to do so as well (Wilson & Ampey-Thornhill, 2001). Children who are involved in these interventions may practice better dietary habits into adolescence and adulthood. An intervention with Latino mothers with Type 2 diabetes and their overweight daughters made use of this strong social tie to promote weight loss and healthy eating (Sorkin et al., 2014).

Community interventions aimed at dietary change have been undertaken. For example, nutrition education campaigns in supermarkets have shown some success. In one study, a computerized, interactive nutritional information system placed in supermarkets significantly decreased high-fat purchases and somewhat increased high-fiber purchases (Jeffery, Pirie, Rosenthal, Gerber, & Murray, 1982; Winett et al., 1991).

Tailoring dietary interventions to ethnic identity and making them culturally and linguistically appropriate may achieve particularly high rates of success (Eakin et al., 2007; Martinez et al., 2008; Resnicow, Davis, et al., 2008). In Latino populations, face-to-face contact with a health adviser who goes through the steps for successful diet modification may be especially important, due to the emphasis on personal contact in Latino culture and communities (Elder et al., 2005).

Researchers are moving toward interventions that are cost-effective to alter behavior related to diet and

exercise, rather than large-scale CBT interventions. For example, computer-tailored dietary fat intake interventions can be effective both with adults and with adolescents (Haerens et al., 2007). Telephone counseling can achieve beneficial effects (Madlensky et al., 2008). Such interventions can reach many people at relatively low cost.

Change is likely to come from social engineering as well. When children have access to school snack bars that include sodas, candy, and other unhealthy foods, it undermines their consumption of healthier foods (Cullen & Zakeri, 2004).

Some of these interventions may seem heavy-handed. After all, most people eat what they want based on their preferences or what is available. Nudging people in the right direction through subtle messages may work as well as, or better than, explicit warnings (Wagner, Howland, & Mann, 2015). Eliminating snack foods from schools, making school lunch programs more nutritious, making snack foods more expensive and healthy foods less so, and taxing products high in sugar or fats (Brownell & Frieden, 2009) will make some inroads into promoting healthy food choices.

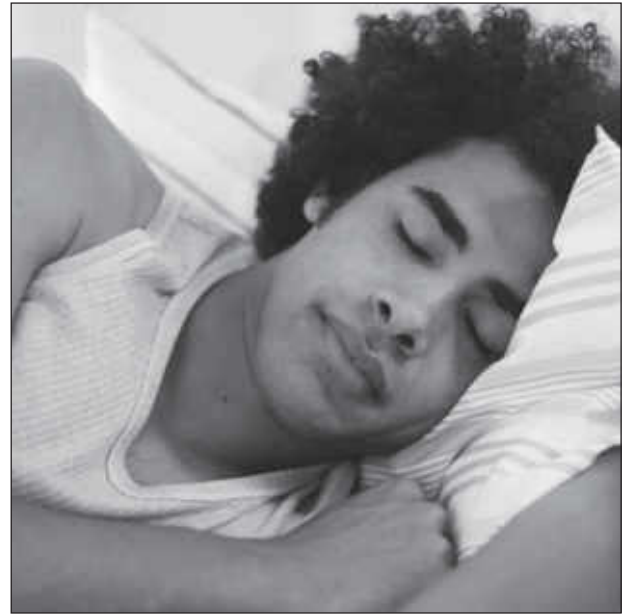
■ SLEEP

Michael Foster, a trucker who carried produce, was behind in his truck payments. To catch up, he needed to make more runs each week. To do so, he began cutting back from 6 hours of sleep a night to 3 or 4, stretches that he grabbed in his truck between jobs. On an early-morning run between Fresno and Los Angeles, he fell asleep at the wheel and his truck went out of control, hitting a car and killing a family.

What Is Sleep?

Sleep is a vital health habit. It has a powerful effect on risk of infectious disease, risk of depression, poor responses to vaccines, and the occurrence and progression of several chronic disorders, including cardiovascular disease and cancer (Irwin, 2015). But sleep is often abused.

There are two broad types of sleep: non-rapid eye movement (NREM) and rapid eye movement (REM). NREM sleep consists of four stages. Stage 1, the lightest and earliest stage of sleep, is marked by theta waves, when we begin to tune out the sounds around us, although we are easily awakened by any loud



Scientists have begun to identify the health risks associated with little or poor-quality sleep.

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sound. In stage 2, breathing and heart rates even out, body temperature drops, and brain waves alternate between short bursts called sleep spindles and large K-complex waves. Stages 3 and 4, deep sleep, are marked by delta waves. These are the phases most important for restoring energy, strengthening the immune system, and prompting the body to release growth hormone. During REM sleep, eyes dart back and forth, breathing and heart rates flutter, and we often dream vividly. This stage of sleep is marked by beta waves and is important for consolidating memories, solving problems from the previous day, and turning knowledge into long-term memories (Irwin, 2015). All of these phases of sleep are essential.

Sleep and Health

An estimated 50–70 million Americans suffer from chronic sleep disorders—most commonly, insomnia (Centers for Disease Control and Prevention, September 2015). Many other people, such as college students, choose to deprive themselves of sleep in order to keep up with all the demands on their time. But sleep is an important restorative activity, and people who deny themselves sleep may be doing more harm than they realize.

Roughly 40 percent of adults sleep less than 7 hours a night on weeknights, one-third of adults

experience sleep problems (Stein, Belik, Jacobi, & Sareen, 2008), and 54 percent of people over age 55 report insomnia at least once a week (Weintraub, 2004). For women, sleep disorders may be tied to hormonal levels related to menopause (Manber, Kuo, Cataldo, & Colrain, 2003). Even children who sleep too little or too much incur health risks, including risk of early death (Duggan, Reynolds, Kern, & Friedman, 2014); low socioeconomic status contributes to poor sleep among children (El-Sheikh et al., 2013).

Insufficient sleep (less than 7 hours a night) affects cognitive functioning, mood, job performance, and quality of life (Karlson, Gallagher, Olson, & Hamilton, 2012; Pressman & Orr, 1997). Any of us who has spent a sleepless night tossing and turning over some problem knows how unpleasant the following day can be. Insomnia compromises well-being on the short term and quality of life on the long term (Karlson, Gallagher, Olson, & Hamilton, 2013). Poor sleep can be a particular problem in certain high-risk occupations, such as police work, in which officers are exposed to traumatic events (Irish, Dougall, Delahanty, & Hall, 2013).

As noted, there are health risks of inadequate sleep (Leger, Scheuermaier, Phillip, Paillard, & Guilleminault, 2001). Chronic insomnia can compromise the ability to secrete and respond to insulin (suggesting a link between sleep and diabetes); it increases the risk of coronary heart disease (Ekstedt, Åkerstedt, & Söderström, 2004); it increases blood pressure and dysregulates stress physiology (Franzen et al., 2011); it can affect weight gain (Motivala, Tomiyama, Ziegler, Khandrika, & Irwin, 2009); it can reduce the efficacy of flu shots; and it is tied to adverse immune changes including chronic inflammation (Motivala, 2011). More than 70,000 of the nation's annual automobile crashes are accounted for by sleepy drivers, and 1,550 of these are fatal each year. In one study of healthy older adults, sleep disturbances predicted all-cause mortality over the next 4–19 years of follow-up (Dew et al., 2003). Children who do not get enough sleep may show behavioral problems (Pesonen et al., 2009). By contrast, good sleep quality can act as a stress buffer (Hamilton, Catley, & Karlson, 2007).

Who can't sleep? People who are going through major stressful life events or traumas, who are suffering from major depression (Sivertsen et al., 2012), who are experiencing stress at work (Burgard & Ailshire, 2009), who are experiencing socioeconomic

adversity (Jarrin, McGrath, & Quon, 2014), who have high levels of hostility or arousal (Fernández-Mendoza et al., 2010; Granö, Vahtera, Virtanen, Keltikangas-Järvinen, & Kivimäki, 2008), who use maladaptive coping strategies to cope with stress (Fernández-Mendoza et al., 2010), and who ruminate on the causes of their stress (Zawadzki, Graham, & Gerin, 2012) have poor sleep quality and report sleep disturbances. Stressful events regarded as uncontrollable can produce insomnia (Morin, Rodrigue, & Ivers, 2003). People who deal with stressful events by ruminating or focusing on them are more prone to insomnia than are those who deal with stressful events by blunting their impact or distracting themselves (Fernández-Mendoza et al., 2010; Voss, Kolling, & Heidenreich, 2006; Zoccola, Dickerson, & Lam, 2009). Sleep may have particular significance for people low in SES, as low SES is linked to poor subjective and objective sleep quality (Friedman et al., 2007; Mezick et al., 2008). Abuse of alcohol is also related to poor sleep quality (Irwin, Cole, & Nicassio, 2006).

Although the health risks of insufficient sleep are now well known, less well known is the fact that people who habitually sleep more than 7 hours every night also incur health risks (van den Berg et al., 2008a). Long sleepers, like short sleepers, also have more symptoms of psychopathology, including chronic worrying (Grandner & Kripke, 2004).

Behavioral interventions have been undertaken for the treatment of insomnia, including mindfulness-based interventions (Britton, Haynes, Fridel, & Bootzin, 2010), relaxation therapy, control of sleep-related behaviors (such as the routine a person engages in before going to sleep), and cognitive-behavioral interventions. All these treatments show success in treating insomnia (Irwin et al., 2006). Table 4.3 lists some of the recommendations used in interventions to promote better sleep.

■ REST, RENEWAL, SAVORING

An important set of health behaviors that is only beginning to be understood involves relaxation and renewal, the restorative activities that help people savor the positive aspects of life, reduce stress, and restore emotional balance (Pressman et al., 2009). For example, simply not taking a vacation is a risk factor for heart attack among people with heart disease (Gump & Matthews, 1998; Steptoe, Roy, & Evans, 1996). Participating in enjoyable leisure time

TABLE 4.3 | A Good Night's Sleep

- Get regular exercise, at least three times a week.
- Keep the bedroom cool at night.
- Sleep in a comfortable bed that is big enough.
- Establish a regular schedule for awakening and going to bed.
- Develop nightly rituals that can get you ready for bed, such as taking a shower.
- Use a fan or other noise generator to mask background sound.
- Don't consume too much alcohol and don't smoke.
- Don't eat too much or too little at night.
- Don't have strong smells in the room, such as from incense, candles, or lotions.
- Don't nap after 3 p.m.
- Cut back on caffeine, especially in the afternoon or evening.
- If awakened, get up and read quietly in another place, so that bed is associated with sleep, not sleeplessness.

Sources: Gorman, 1999; S. L. Murphy, 2000.

activities, such as hobbies, sports, socializing, or spending time in nature, has been tied to lower blood pressure, lower cortisol, lower weight, and better physical functioning. Satisfaction with leisure activities can improve cognitive functioning among the elderly (Singh-Manoux, Richards, & Marmot, 2003) and promote good health behaviors (Kim, Kubzansky, & Smith, 2015).

Unfortunately, little other than intuition currently guides our thinking about restorative processes. Nonetheless, health psychologists suspect that rest, renewal, and savoring—involving activities such as going home for the holidays, relaxing after exams, and enjoying a walk or a sunset—have health benefits. ●

S U M M A R Y

1. Health-enhancing behaviors are practiced by people to improve their current and future health. Such behaviors include exercise, accident prevention measures, cancer detection processes, consumption of a healthy diet, 7–8 hours of sleep each night, and opportunities for rest and renewal.
2. Exercise reduces risk for heart attack and improves other aspects of bodily functioning. Exercise also improves mood and reduces stress.
3. Few people adhere regularly to the standard exercise prescription of at least 30 minutes at least three times a week. People are more likely to exercise when the form of exercise is convenient and they like it, if their attitudes favor exercise, and if they come from families in which exercise is practiced.
4. Cognitive-behavioral interventions, including relapse prevention components, have been moderately successful in helping people adhere to regular exercise programs.
5. Accidents are a major cause of preventable death, especially among children and adolescents. Publicity in the mass media, legislation promoting accident prevention measures, training of parents by health practitioners, and interventions to promote safety measures for children have reduced these risks.
6. Mammograms are recommended for women over age 50, yet not enough women, especially minority and older women, undergo them because of lack of information, unrealistic fears, and the high cost and lack of availability of mammograms. Colorectal screening is also an important cancer-related health behavior.
7. Dietary interventions involving reductions in cholesterol, fats, calories, and additives and increases in fiber, fruits, and vegetables are widely recommended. Yet long-term adherence to such diets is limited for many reasons: Recommended diets are sometimes boring; tastes are hard to change; and behavior change often falls off over time.
8. Dietary interventions through the mass media and community resources have promise. Intervening with the family is also helpful in promoting and maintaining dietary change. Cognitive behavioral therapeutic interventions (CBT) have been successfully employed to alter diet, although recent interventions have moved to less costly formats, such as telephone interventions.
9. Sufficient sleep, rest renewal, and relaxation are also important health behaviors. Many people abuse their sleep intentionally or suffer from insomnia. A variety of behavioral methods that promote relaxation can offset these risks. In addition, setting aside time to savor the pleasant aspects of life and simply taking a vacation may have health benefits.

K E Y T E R M

aerobic exercise