8

OBESITY AND DISORDERED EATING

Learning Objectives

8.1 Describe the measurement and consequences of obesity, and the role of genetic factors in influencing weight

8.2 Summarize how psychosocial factors contribute to obesity

8.3 Compare different strategies for reducing obesity

8.4 Describe different types of eating disorders and the role of genetic factors in contributing to such disorders

8.5 Explain how psychosocial factors contribute to disordered eating

8.6 Compare different strategies for reducing disordered eating

What You'll Learn

8.1 How does a home team NFL loss impact snacking?

8.2 Why do most contestants on reality TV weight-loss shows regain their weight?

8.3 Does posting calories on menu items change ordering at Starbucks?

8.4 Can spending time on Facebook lead to disordered eating?

8.5 Why do some people overeat in response to stress?

Preview

Coverage of the "obesity epidemic" in the United States is widespread, including in newspapers, in magazines, online, and on television. Articles describe at length the health problems associated with obesity, and various strategies—exercise, drugs, surgery—to overcome it.

(Continued)

Yet these same media outlets regularly feature images of extremely thin women, and often muscular men, clearly suggesting that these body shapes represent the ideal. In this chapter, you'll learn about the complexities of predicting overweight and obesity as well as disordered eating, including their consequences, biological and psychosocial factors that contribute to their development, and strategies for both preventing and treating unhealthy eating.

UNDERSTANDING OBESITY

LO 8.1

Describe the measurement and consequences of obesity, and the role of genetic factors in influencing weight

Many Americans struggle to manage their weight. Over one third of American adults, and 17% of children and adolescence, are considered obese (Ogden, Carroll, Fryar, & Flegal, 2015). **Obesity** rates are particularly high among people of color; an estimated 48.1% of Black adults and 42.5% of Latino adults are obese, compared to 34.5% of White adults and only 11.7% of Asian American adults. Moreover, and as shown in Figure 8.1, the rate of obesity has climbed over the last 20 years, and is expected to continue to increase. This section describes how obesity is measured, its consequences, and the impact of genetic factors on weight.

Figure 8.1 Rates of Obesity Over Time

Rates of obesity have increased in both adults and youth (children, teenagers) over the last 20 years.
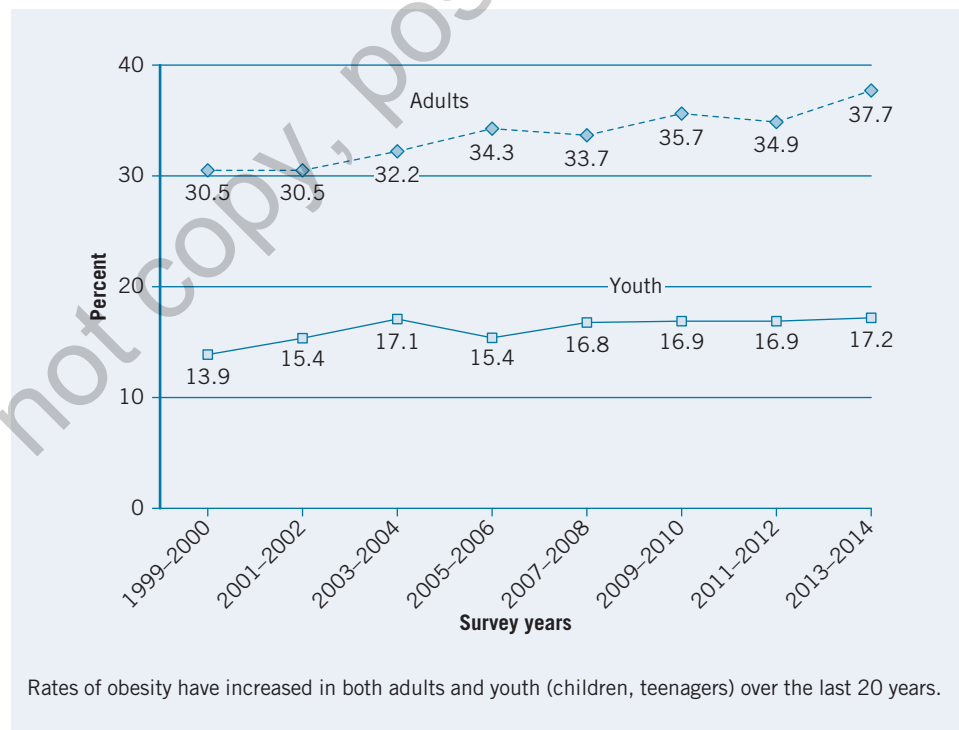
Source: Ogden et al. (2015).

Measuring Obesity

For many years, researchers relied on the use of tables that simply plotted normal weight ranges for people of various heights. Unfortunately, because muscle tissue and bones weigh more than fat, relying on only weight as a measure of obesity can cause some highly fit people, such as muscular athletes, to test as obese. A more accurate way to assess obesity is by calculating percentage of body fat, which can be tested by measuring a pinch of skin in several places on a person's body or (ideally) using a water immersion technique. However, because the pinch test is not particularly accurate and the water immersion method is time-consuming and expensive, body fat measures are not widely used to determine obesity.

The most common measure of obesity today is **body mass index (BMI)**, which is calculated by dividing a person's weight (in kilograms) by the person's height (in meters) and squaring the sum (see Table 8.1). A BMI between 19 and 24 is considered ideal; 25 to 29 is moderately **overweight** (about 15% to 30% over ideal weight); and people with indexes

Table 8.1   Body Mass Index (BMI) Calculation Table

BMI (kg/m²)	19	20	21	22	23	24	25	26	27	28	29	30	35	40
Height (in.)	Weight (lb.)													
58	91	96	100	105	110	115	119	124	129	134	138	143	167	191
59	94	99	104	109	114	119	124	128	133	138	143	148	173	198
60	97	102	107	112	118	123	128	133	138	143	148	153	179	204
61	100	106	111	116	122	127	132	137	143	148	153	158	185	211
62	104	109	115	120	126	131	136	142	147	153	158	164	191	218
63	107	113	118	124	130	135	141	146	152	158	163	169	197	225
64	110	116	122	128	134	140	145	151	157	163	169	174	204	232
65	114	120	126	132	138	144	150	156	162	168	174	180	210	240
66	118	124	130	136	142	148	155	161	167	173	179	186	216	247
67	121	127	134	140	146	153	159	166	172	178	185	191	223	255
68	125	131	138	144	151	158	164	171	177	184	190	197	230	262
69	128	135	142	149	155	162	169	176	182	189	196	203	236	270
70	132	139	146	153	160	167	174	181	188	195	202	207	243	278
71	136	143	150	157	165	172	179	186	193	200	208	215	250	286
72	140	147	154	162	169	177	184	191	199	206	213	221	258	294
73	144	151	159	166	174	182	189	197	204	212	219	227	265	302
74	148	155	163	171	179	186	194	202	210	218	225	233	272	311
75	152	160	168	176	184	192	200	208	216	224	232	240	279	319
76	156	164	172	180	189	197	205	213	221	230	238	246	287	328

Source: Bray & Gray (1988).

greater than 30 are considered obese (about 40% over ideal weight). Obesity, in turn, is divided into three distinct categories. People with a BMI of 30 to 35 are on the low end of obesity, those with a BMI of 35 to 40 have a moderate level, and those with a BMI of 40 or higher have "extreme" or "severe" obesity.

Although BMI is widely used as an easy test of obesity, this measure has some distinct limitations. Specifically, many people who are healthy may have a BMI indicating they are obese, and many people who are obese—as determined by their BMI—are actually healthy based on physiological data. For example, researchers in one study examined health data, including blood pressure and cholesterol, from over 40,000 adults (Tomiyama, Hunger, Nguyen-Cuu, & Wells, 2016). Their findings indicated that 47% of people classified as overweight, and 29% of those classified as obese, were healthy based on the physiological measures. On the other hand, 31% of people who were classified as normal weight were considered healthy based on physiological data. Thus, relying solely on BMI as a measure of health would classify an estimated 75 million American adults as unhealthy.

Consequences of Obesity

Regardless of how it is measured, obesity is associated with substantial consequences, including physical, psychological, and social.

Physical Consequences

Obesity is associated with a variety of negative physical consequences. People who are obese are at an increased risk of developing hypertension, kidney disease, gallbladder disease, diabetes, cardiovascular disease, and some types of cancer (Bray, 1992; Gallagher & LeRoith, 2015; Manson et al., 1990). In fact, being overweight or obese increases the risk of developing many different types of cancer, including breast, ovarian, colorectal, liver, and kidney (Lauby-Secretan et al., 2016). One of the most common health problems associated with obesity is *diabetes*, a chronic endocrine disorder in which the body is not able to produce or use the hormone insulin (as you'll learn more about in *Chapter 10: Understanding and Managing Chronic Illness*). Type 2 diabetes (or non-insulin-dependent diabetes), which accounts for approximately 90% of diabetes cases, is most prevalent in older people and in those who are obese (Haffner, 1998). For example, 80% of people with Type 2 diabetes are obese, and a growing number of overweight children and adolescents are developing signs of diabetes (Sinha et al., 2002). Obesity in women is associated with infertility, miscarriage, and poor pregnancy outcomes (Talmor & Dunphy, 2015). Overweight and obese pregnant women are also at greater risk of premature death and cardiovascular disease, even when taking into account other variables, such as socioeconomic status, smoking, gestation at BMI measurement, preeclampsia, and low birth weight (Lee et al., 2015).

Most important, people who are overweight have higher rates of mortality, and are particularly at risk of dying from cardiovascular disease (Stevens et al., 1998; Yusuf et al., 2005). Being severely overweight is associated with even greater risks—very obese men and women (those with BMIs above 40) were twice as likely to die in a given period of time as those who were of normal weight (Bender, Trautner, Spraul, & Berger, 1998). In contrast, people with a BMI between 18.6 and 23.0 (for women) and 19.9 to 22.6 (for men) had the lowest rates of coronary heart disease, diabetes, and mortality (Lew, 1985).

Although this section has examined the negative physical effects of obesity, some research calls into question this association. First, the distribution of weight on a body may be a better predictor of health than simply the amount of weight (Wickelgren, 1998). People who have upper-body fat (e.g., "apples") are at a greater risk of experiencing major health problems, such as diabetes, hypertension, and cardiovascular disease, than those who have lower-body

fat (e.g., "pears"). In fact, the weight accumulated around one's waist may be a better predictor of mortality than overall obesity (Folsom et al., 1993). One reason why having upper-body fat is associated with such negative health consequences is that fat cells in the abdomen are much larger than fat cells in the legs and butt; hence, abdominal fat cells are more likely to form fatty acids. In turn, high levels of fatty acids in the blood lead to higher levels of glucose in the blood as well as higher blood pressure. Second, obese people who are physically fit, and hence show normal levels of blood pressure and cholesterol, are at no greater risk of dying from cardiovascular disease or cancer than those who are of normal weight (Ortega et al., 2013). These findings suggest that fitness, not weight, is a better predictor of health outcomes.

Social and Psychological Consequences

Obese people also suffer negative social and psychological consequences. They tend to be rated as less likable, are at a disadvantage in dating people, get lower grades, earn less, and are generally the subject of negative social attitudes (Ryckman, Robbins, Kazcor, & Gold, 1989). Sadly, people who feel discriminated against due to their weight show increases in depression over time (Robinson, Sutin, & Daly, 2017).

One reason why there are such negative views about obese people is that obesity is often seen as something that is within a person's control—obese people are seen as slow, lazy, sloppy, and lacking in willpower (Ryckman et al., 1989; Thomas, Olds, Pettigrew, Randle, & Lewis, 2014). We often have the view that if they wanted to lose weight, they could just stop eating so much, so we blame obese people for their weight. But are obese people really different from others? No—the personality characteristics of obese and nonobese people are very similar (Poston et al., 1999).

The Role of Genetics

Genetic factors clearly play a role in obesity (Albuquerque, Manco, & Nóbrega, 2016; Albuquerque, Stice, Rodríguez-López, Manco, & Nóbrega, 2015). Obese people are more likely than nonobese people to have had obese parents and obese grandparents (Noble, 1997), and obese parents are more likely to have obese children. For example, about 7% of the children of normal-weight parents are obese, compared with 40% of the children in families with one obese parent and 80% in families with two obese parents (Mayer, 1980).

We cannot, however, attribute obesity solely to genetic factors based upon this correlation alone. After all, parents who are obese might tend to buy and cook mostly high-fat foods or encourage their children to overeat, which may point to an environmental cause of obesity. However, studies of adopted children provide some compelling evidence for the link between genetics and obesity. First, identical twins are very similar in terms of BMI regardless of whether they are raised together or apart, and identical twins are much more similar in BMI than are same-sex fraternal twins (Grilo & Pogue-Geile, 1991). Second, there is a much stronger relationship between the adopted children's and their biological parents' weight than there is between the children's weight and their adoptive parents' weight, and there is no significant correlation in weight between adopted siblings who are raised together (Grilo & Pogue-Geile, 1991). Genetic factors appear to predict about 40% to 70% of the variation in BMI (Comuzzie & Allison, 1998; Wardle, Carnell, Haworth, & Plomin, 2008).

Although research on the genetic factors predicting obesity is still relatively new, recent evidence suggests that genes may influence obesity in a variety of ways. This section examines how genes may influence food preferences and metabolism.

Mark Richards/ZUMAPRESS/Newscom

Although obese parents are more likely to have obese children, both genetic and environmental factors clearly contribute to this associationl.

Genes Impact Food Preferences

Genes may influence how much—and even what—people want to eat. Research with mice demonstrates that a gene is responsible for directing the fat cells to release **leptin**, a hormone that decreases appetite and increases energy expenditure (Wang et al., 1999). In turn, when we lose weight (and lose fat cells), less leptin is released into our bloodstream, which may lead us to feel hungrier. Obese people might also have a genetic preference for energy-dense fat-containing foods, such as chocolate, ice cream, pastries, and whipped cream (Drewnowski, 1996). Because dietary fats are the most concentrated source of energy, people who are obese might be particularly sensitive to these foods.

Genes Impact Metabolism

Genes may also influence **metabolism**, the rate the body uses energy to carry out basic physi-ological processes, such as respiration, digestion, and blood pressure (Comuzzie & Allison, 1998). People who have a high metabolism are thought to use more energy to carry out these processes; hence, they burn off more calories. On the other hand, people with a lower meta-bolic rate gain more weight than people with higher metabolic rates, presumably because their bodies are not burning off as many calories (Ravussin et al., 1988). For example, when normal-weight people are asked to eat an extra 1,000 calories a day for eight weeks, some vol-unteers gain considerable amounts of weight (over 9 pounds), whereas others gain only small amounts (less than 1 pound) (Levine, Eberhardt, & Jensen, 1999). The biggest predictor of low levels of weight gain was the incidental physical activity (not intentional exercise) people engaged in as part of daily life, such as fidgeting, sitting up straight, and flexing their muscles. People may vary in how easily they engage in activities that burn fat.

According to **set-point theory**, each person's body has a certain weight that it strives to maintain, much like a thermostat device (Keesey, 1995). When you eat fewer calories, your metabolism slows to keep your weight at the same level. Because people's set points may vary based on heredity, some will be heavier and some will be lighter. One way it may work is that the set point is determined by the number of fat cells a person has (Leibel, Berry, & Hirsch, 1983). Although there is little or no difference in the number of fat cells between people of normal weight and those who are slightly overweight, people who are severely obese have many more fat cells. Another possibility is that the hypothalamus influences fat stores and/or levels of glucose or insulin in the blood, which in turn influence feelings of hunger and full-ness. In line with this view, research with animals demonstrates that damage to a certain part of the hypothalamus can lead to a change in weight, perhaps by allowing a new set point to be established (Keesey & Powley, 1975).

Conclusions

Although genes do play some role in obesity, it is clear that they do not totally predict a person's weight. First, rates of obesity in the United States have increased dramatically in recent years, which means genetics can't explain it all (Hill & Peters, 1998; Katan, Grundy, & Willett, 1997). Second, people with the same genetic background who live in different parts of the world often have very different body weights (Hodge & Zimmet, 1994). For example, Japanese people who live in Japan are thinner than those who move to Hawaii, and Japanese people who live in Hawaii are thinner than those who move to the continental United States (Curb & Marcus, 1991). These differences in weight suggest that while genetics may play some role, cultural factors including diet and exercise also influence weight.

Even if genes do play some role in influencing weight, whether these genes are activated (an epigenetic effect) may depend on environment factors. For example, in-utero experiences, such as experiencing malnutrition or extreme stress, may activate genes that regulate appetite

in ways that make weight gain more likely to occur (Burgio, Lopomo, & Migliore, 2014). These very early life experiences may also lead to changes in the hypothalamus, a part of the brain that regulates appetite. In line with this view, one study of 100,000 young men found that those whose mothers experienced the death of a close relative during or just before their pregnancy were significantly more likely to become overweight or obese as adults (Hohwü, Li, Olsen, Sørensen, & Obel, 2014). In fact, those whose mothers had lost their husbands—a particularly severe stressor—were at twice the risk of developing weight problems in adulthood.

Finally, explaining obesity as a function of genes may have negative consequences. Specifically, a belief that obese people have no control over their weight leads people to feel they have less control over their own weight (Dar-Nimrod, Cheung, Ruby, & Heine, 2014). In fact, simply reading a (fictitious) article suggesting that obesity is caused by genes leads people to later eat more cookies than reading an article suggesting obesity is caused by psychosocial factors! On the other hand, overweight people who read an article describing the role of environmental factors, such as the ready accessibility of junk food, in contributing to obesity show greater self-efficacy to lose weight (Pearl & Lebowitz, 2014). These findings point to the downside of overemphasizing the role of genes in predicting weight.

PSYCHOSOCIAL FACTORS CONTRIBUTING TO OBESITY

Although genetic and biological factors do influence how much we eat, they aren't the whole story. There are probably many times you have eaten even when you have not been hungry, for instance. Maybe you eat when you are nervous; maybe you eat after you walk by a shop selling great-smelling cinnamon rolls in the mall; maybe you eat mindlessly while watching TV. All of these are examples of psychological factors that may lead to eating (and overeating). This section will examine various psychological factors that influence eating: the internal-external hypothesis, mood regulation, restraint theory, and sociocultural factors.

Internal-External Hypothesis

One of the earliest hypotheses explaining obesity was the **internal-external hypothesis**, which proposed that people often fail to listen to their internal cues for eating (namely, hunger), and instead pay attention to external cues, such as food taste, smell, and variety (Schachter, 1968). In line with this hypothesis, you've probably noticed that even when you are not hungry, tempting food smells and tastes can influence you to eat. We also eat more when we have a variety of different types of foods available (just think about a time you've overeaten at an all-you-can-eat buffet) (Rolls et al., 1981).

In support of Schachter's theory, obese people do eat more when foods taste particularly good (Kauffman, Herman, & Polivy, 1995). For example, when normal-weight people were placed on a hospital diet—meaning the only thing they could eat was a bland liquid diet shake—they basically took in the same number of calories as they did in normal life (Hashim & Van Itallie, 1965). In other words, they ate to maintain their weight, and presumably they relied on their internal cue of hunger to guide their eating. On the other hand, obese people consumed significantly fewer calories on this diet than they normally did, presumably because the external cues of eating were weak. These findings suggest that obese people show a close connection to the external circumstances of eating, whereas for normal-weight people, the close connection is between their physiological state—that is, their hunger—and the amount eaten.

More recent research, however, provides little support for the internal-external theory. First, even people of normal weight are not particularly good at interpreting internal signals

for hunger, such as low blood sugar and stomach pains (Rodin, 1981). People are also not very good at surmising how many calories they have consumed or how many calories their bodies need to maintain weight. Second, people at varying weight levels, including those of average weight, can and do eat in response to external cues, such as the presence of food and whether other people are eating (Elliston, Ferguson, Schüz, & Schüz, 2017). For example, people vary in how appealing they find different types of snack foods, as well as how well they are able to control these desires (Nederkoorn, Houben, Hofmann, Roefs, & Jansen, 2010).

Restraint Theory

Restraint theory was developed in part to explain the mixed findings from research testing the internal-external theory. According to **restraint theory**, people are generally motivated to eat as a function of internal physiological signals that cue hunger (Herman & Polivy, 1984). However, when people are trying to lose weight—either because they are obese or because they are dieting—they deliberately ignore these internal signals and instead use cognitive rules to limit their caloric intake. For example, so-called restrained eaters might develop rules about eating only certain types of foods (e.g., celery, carrots, nonfat yogurt) and avoiding other types of foods (e.g., ice cream, brownies, meat).

This approach can be successful in helping people restrict their eating, but it can also backfire. Specifically, restrained eaters often develop an "all-or-nothing" mind-set about eating, which means that breaking the rules by eating small amounts of "forbidden food" can lead to overeating. For example, a person who is dieting but who gives in and eats a fattening first course at a dinner party may think, "Well, I've blown it now, so I may as well eat all I want." Similarly, while people who are high in restrained eating generally eat fewer calories than those who are not high in restraint, they eat substantially more than nonrestrained eaters if eating while walking—suggesting that "eating on the go" may distract restrained eaters from their goal (Ogden, Oikonomou, & Alemany, 2015). Similarly, when restrained eaters feel sad or stressed, they give up the cognitive rules and can then eat excessive amounts (Heatherton, Striepe, & Wittenberg, 1998).

However, other research suggests that restraint theory is not always a good predictor of eating behavior (Lowe, 1993). Specifically, people who are restrained eaters but are not at the moment actively trying to lose weight should overeat under various conditions (when they are sad, when they are stressed, etc.). On the other hand, people who are actively trying to diet may also develop rules to guide their eating, but these people should not engage in the same type of "all-or-nothing" eating that nondieting restrained eaters show. In support of this view, restrained nondieters eat more after they have first had a milkshake (because they have already blown their diet anyway), whereas restrained dieters eat significantly less after having a milkshake (because they are actively trying to lose weight) (Lowe, Whitlow, & Bellwoar, 1991).

Mood Regulation

Considerable research indicates that people may eat to influence how they feel (a factor psychologists describe as *mood regulation*). For example, people eat when they experience negative affect (e.g., bored, angry, sad, stressed), presumably in an attempt to make themselves feel better (Elliston et al., 2017). As described in *Chapter 4: Understanding Stress*, people who experience more stress eat more high-fat or high-sugar between-meal snacks, have less main meal and vegetable consumption, and show higher levels of emotional eating and haphazard planning of eating, which in turn can, not surprisingly, lead to weight gain (Hannerz, Albertsen, Nielsen, Tüchsen, & Burr, 2004; O'Connor, Jones, Conner, McMillan, & Ferguson, 2008; Sims et al., 2007). In line with this view, children who are exposed to

serious stressors, such as poverty and family disruptions, are more likely to become obese during adolescence (Hernandez & Pressler, 2015).

To examine the impact of a pretty typical daily life stress on eating, researchers measured how professional football losses influence eating patterns in the team's home city (Cornil & Chandon, 2013). To test this question, data were collected on the total consumption of calories as well as the amount of saturated fats (e.g., pizza, cakes, cookies) consumed in cities (including those both with an NFL team and not). First, findings revealed there were no differences in calories or fats consumed on Sundays, regardless of whether the city had an NFL or not, and, for those with an NFL team, regardless of the game outcome. On Mondays, however, consumption of both calories and saturated fats increased in cities in which the home team lost and decreased in cities in which the home team won; there were no differences in rate of consumption for cities without an NFL team or for those in which the home team didn't play. Interestingly, the effect of game outcome on consumption was particularly strong in cities with the most devoted fans; saturated fat consumption increased by 28% in these cities following defeat (compared to 9% in the other cities) and decreased by 16% following victories (compared to 4% in the other cities).

Although the studies described thus far are correlational, and thus it is difficult to determine the precise way in which stress influences eating, experimental research yields similar findings. For example, people who are watching sad movies—such as the tragedy *Love Story*—eat substantially more popcorn than those who are watching a funny movie—such as the comedy *Sweet Home Alabama* (Garg, Wansink, & Inman, 2007). Bad moods are particularly likely to lead people to eat more "comfort foods" when they are trying to suppress such moods, indicating that people who aren't able to regulate their moods in an adaptive way show more signs of eating as a way of coping with bad emotions (Evers, Stok, & de Ridder, 2010).

There is rather mixed evidence, however, for the view that stress consistently leads to overeating (Rosengren et al., 2015). In fact, while some people seem to eat more when under stress, others eat less (Sproesser, Schupp, & Renner, 2014; Willenbring, Levine, & Morley, 1986). This tendency to eat more when stressed is more common among those who are obese and/or trying to lose weight (Baucom & Aiken, 1981; Friedman & Brownell, 1995). One study of female college students found that obese students ate nearly seven times as much during exam period as normal-weight students, whereas there was virtually no difference in how much obese and nonobese students ate during less stressful periods of the semester (Slochower, Kaplan, & Mann, 1981). So, all of this research suggests that some people may indeed overeat when they are experiencing stress, but stress does not lead everyone to overeat. You can measure how much different emotions impact your eating by completing **Table 8.2: Test Yourself**.

Situational Factors

As you probably already know, situational factors influence not only how much we eat but also what we eat. These factors include social influences, the environment, and culture.

Social Influences

People eat more when they are with other people than when they are alone, and are particularly likely to eat more when eating with family and friends (de Castro, 1994; de Castro & de Castro, 1989; Feunekes, De Graaf, & Van Staveren, 1995; Lumeng & Hillman, 2007). Having other people around may lead to more eating in part because meals last longer. We may also be less sensitive to internal cues for hunger when we are with other people. For example, if you are eating alone, the amount you eat is influenced by how hungry you are (e.g., if you had a late or big lunch, you eat less for dinner), whereas if you are eating with other people, you eat the same amount regardless of when you have last had a meal.

Table 8.2 Test Yourself: Are You an Emotional Eater?

This scale measures the tendency to eat in response to different types of emotions. Rate how much each of the following emotions leads you to feel an urge to eat using a scale of 1 to 5 (1 = no desire to eat at all to 5 = an overwhelming urge to eat).

1. Angry
2. Discouraged
3. Jealous
4. Guilty
5. Nervous
6. Excited
7. Worried
8. Upset
9. Bored
10. Sad
11. Lonely
12. Blue

Add up your scores on items 1 to 4 (which assess anger/frustration), 5 to 8 (which assess anxiety), and items 9 to 12 (which assess depression).
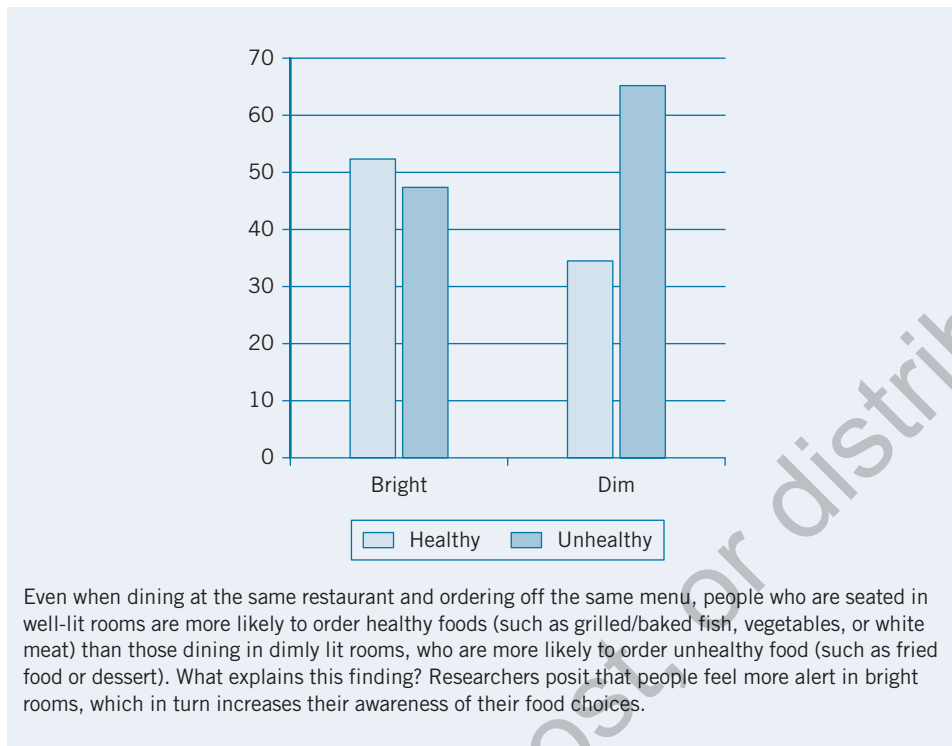
Source: Arnow, Kenardy, & Agras (1995).

Obesity is also linked to particular social networks, meaning that people with social contacts who are obese are more likely to be obese themselves. One study of young adults found that those who were overweight and obese were more likely to have friends and romantic partners who were also considered overweight (Leahey, LaRose, Fava, & Wing, 2011). Moreover, data from a large social network study found that having friends or siblings who are obese increases one's own chances of becoming obese over time (Christakis & Fowler, 2007). Specifically, people's chances of becoming obese increased by 71% if they had a same-sex friend who became obese during that time, by 40% if they had a sibling who became obese, and by 37% if they had a spouse who became obese. (The link between obesity was not seen among neighbors or opposite-sex friends.) This research suggests that obesity may in fact be "contagious," perhaps indirectly, such as through the impact of obesity leading to changes in weight-related norms, and/or directly, such as through impacting food consumption.

Environmental Factors

As described in *Chapter 2: Research Methods*, a series of fascinating studies by Brian Wansink demonstrate that even subtle environmental factors, such as the size of the dish food is served on, influence how much we eat. For example, guests attending an ice cream party who are given a larger bowl serve themselves 31% more ice cream than those who are given a smaller bowl (Wansink, van Ittersum, & Painter, 2006). Similarly, people who serve themselves a snack mix of pretzels, nuts, and chips at a Super Bowl party take—and consume—56% more from large bowls than small ones (Wansink & Cheney, 2005). Even the brightness of a room can influence the types of food people eat (see Figure 8.2).

Figure 8.2   Data From Biswas et al., 2017

Even when dining at the same restaurant and ordering off the same menu, people who are seated in well-lit rooms are more likely to order healthy foods (such as grilled/baked fish, vegetables, or white meat) than those dining in dimly lit rooms, who are more likely to order unhealthy food (such as fried food or dessert). What explains this finding? Researchers posit that people feel more alert in bright rooms, which in turn increases their awareness of their food choices.

Source: Biswas, Szocs, Chacko, & Wansink (2017).

Cultural Factors

Cultural factors such as the availability and amount of food clearly contribute to obesity (Wadden, Brownell, & Foster, 2002). The United States has the highest rates of obesity in the world, but also a great abundance of fast-food restaurants featuring inexpensive and very fatty foods. Not surprisingly, people who live closer to fast-food restaurants have higher BMIs and eat fewer fruits and vegetables, presumably because less nutritious foods are much more readily available (Kruger, Greenberg, Murphy, Difazio, & Youra, 2014). Moreover, food is not simply readily available but is increasingly being served in larger amounts. Portions at both high-end and low-end restaurants (think "Super Size that") in the United States have become bigger over time, which encourages overeating (Hill & Peters, 1998). The original glass Coke bottles that were manufactured in the 1930s held 6½ ounces, whereas the current "single-size" plastic Coke bottle now holds 1 liter, which is five times as much.

These aspects of American culture—including the abundance of food and large portion sizes—help explain why immigrants who move to the United States increase in obesity over time (Goel, McCarthy, Phillips, & Wee, 2004). Specifically, although the prevalence of obesity was 16% among immigrants and 22% among U.S.-born individuals, only 8% of immigrants who had lived in the United States for less than a year were obese compared to 19% among those who had lived in the United States for at least 15 years. These findings suggest that exposure to American culture increases the risk of obesity.

Another factor contributing to obesity is a lack of access to affordable, nutritious foods, at least in certain communities. Specifically, the term *food desert* describes parts of the country

in which people lack access to healthy foods—such as fruits, vegetables, and whole grains—because they do not live near a supermarket and do not have transportation to reach such a store (see Figure 8.3). People living in high-poverty areas, as well as areas with a large proportion of Black residents (regardless of income), are less likely to have access to healthy foods, which may contribute to their increased risk obesity, diabetes, and heart disease (Baker, Schootman, Barnidge, & Kelly, 2006). One recent study found that many neighborhood stores in a city sell little or no fresh fruits and vegetables, and that such stores often have higher prices than supermarkets that are further away (MacNell, Elliott, Hardison-Moody, & Bowen, 2017). In turn, people living in food deserts eat foods that are higher in fat, cholesterol, and sugars than those who live in other areas (De Choudhury, Sharma, & Kiciman, 2016).
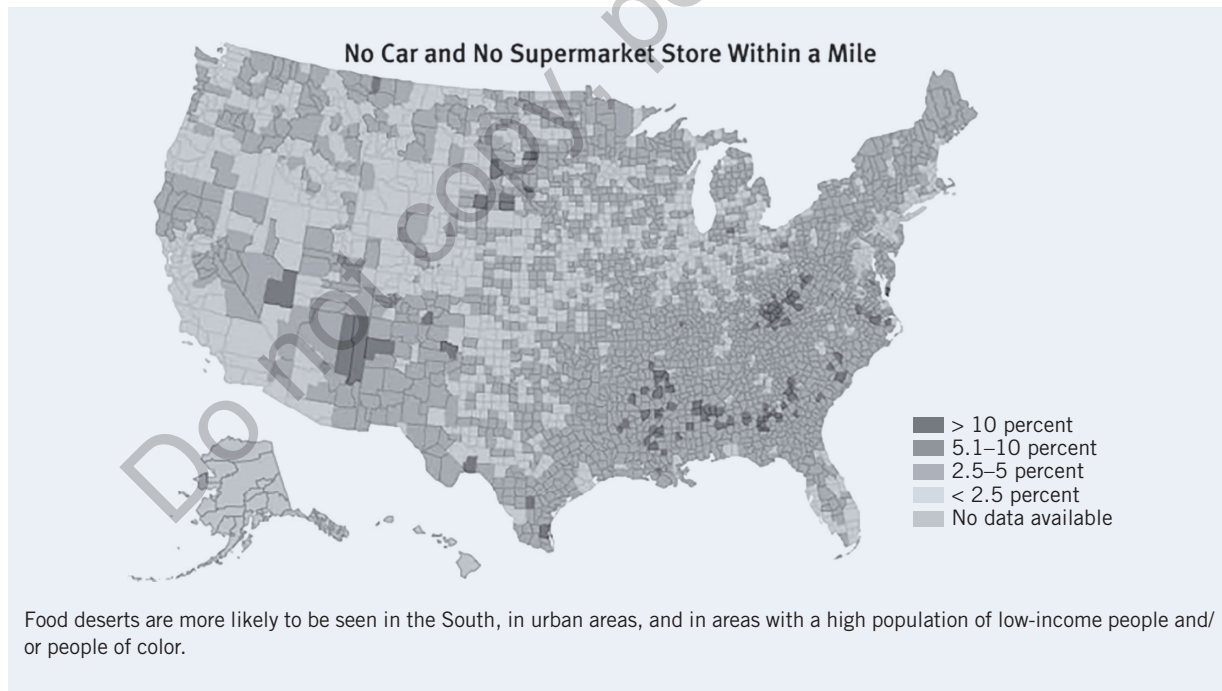
REDUCING OBESITY

LO 8.3

Compare different strategies for reducing obesity

Given the physical, psychological, and social consequences of obesity, reducing rates of obesity is clearly an important goal. This section describes two distinct approaches: preventing obesity and treating obesity.

Preventing Obesity

Preventing obesity must begin in childhood because obese children are very likely to become obese adults (Kelsey, Zaepfel, Bjornstad, & Nadeau, 2014). Fat cells develop in childhood and

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Figure 8.3   Food Deserts in the United States

No Car and No Supermarket Store Within a Mile

> 10 percent
5.1–10 percent
2.5–5 percent
< 2.5 percent
No data available

Food deserts are more likely to be seen in the South, in urban areas, and in areas with a high population of low-income people and/or people of color.

Source: Data from U.S. Department of Agriculture and Centers for Disease Control and Prevention. Public Domain.

adolescence, and once they develop, they never disappear—they can get bigger or smaller, but they never disappear. One study examined the prevalence of adult obesity based on whether six-month-old infants were above or below the 75th percentile for weight (Charney et al., 1976). Only 8% of nonobese infants became obese adults as compared to 14% of obese infants (nearly double the rate). The risk of adult obesity is even greater for children who are obese at older ages. For example, 40% of obese seven-year-olds became overweight adults as compared to only 10% of nonobese seven-year-olds (Stark, Atkins, Wolff, & Douglas, 1981). This section describes effective strategies for preventing obesity.

Avoid Using Food as a Reward

Efforts to prevent obesity can be relatively simple, such as encouraging children to exercise and eat healthy foods and modeling healthy behavior, such as using fruits as dessert, eating healthy snacks, and exercising. However, parents should never use unhealthy food as a reward for good behavior even when it is really tempting to do so. One study of 427 parents of preschool children found that 56% reported promising children a special food, such as a dessert, for finishing their dinner and 48% reported promising children a special food for good behavior, such as cleaning their room (Stanek, Abbott, & Cramer, 1990). But what are the long-term effects of this approach? Children figure out very quickly that the "good foods" come after the "bad foods," and they in fact show an increased desire for "forbidden" foods.

Limit Television

Another important factor in preventing obesity is limiting television watching. First, watching television is a passive activity (particularly with the advent of the remote control). So, when children come home from school (or adults come home from work) and sit in front of the television, they aren't exercising. Studies with both adults (Ching et al., 1996) and children (Andersen, Crespo, Bartlett, Cheskin, & Pratt, 1998) have shown that people who watch a lot of television are more likely to be overweight than those who watch less television. Children from families in which the television is often on during meals also eat more salty snacks and sodas and less fruits, vegetables, and juices than those from families in which the television is rarely on (Coon, Goldberg, Rogers, & Tucker, 2001).

Watching television also exposes children to numerous advertisements for unhealthy foods, which in turn models bad eating habits (Story & Faulkner, 1990). The average child sees more than 20,000 TV commercials in a year, and the two most common types of ads are for toys and food. Moreover, in one study, 97.8% of the 5,000 television food-product advertisements viewed by children 2 to 11 years old were for foods high in fat, sugar, or sodium, and on average 46.1% of the total calories in these products came from sugar (Powell, Szczypka, Chaloupka, & Braunschweig, 2007). For example, 97.6% of cereal advertisements were for high-sugar cereals.

Children who watch considerable amounts of television are at increased risk of obesity, in part because they are exposed to many commercials for unhealthy foods and in part because they are less likely to participate in physical activity than children who watch less television.

This constant exposure to television advertisements also leads children to develop stronger preferences for restaurants featuring unhealthy foods. More than half of 9- to 10-year-old children believe that Ronald McDonald knows what is good for children to eat (Horgen, Choate, & Brownell, 2001). Children also believe that food from McDonald's tastes better. Researchers in one study examined the effects of fast-food branding on children's taste preferences

(Robinson, Borzekowski, Matheson, & Kraemer, 2007). Sixty-three children tasted five pairs of identical foods and beverages in packaging from McDonald's and matched but unbranded packaging and were asked to indicate if they tasted the same or if one tasted better. Overall, children preferred the tastes of foods and drinks if they thought they were from McDonald's. Although children in general prefer the taste of food in a McDonald's package over food in a plain package, this preference is even stronger for children who live in homes with more television sets.

Encourage Physical Activity

Efforts to prevent weight can also focus on increasing the number of calories expended through exercise; in fact, increasing exercise is the single best predictor of long-term weight control (Wadden, 1993). Exercise helps with weight loss in a number of ways, including increasing metabolic rate (so calories are burned at a faster rate), increasing lean body mass (which requires more calories to maintain), and suppressing appetite. Engaging in regular exercise also leads to greater psychological and physical well-being; even moderate amounts of exercise can decrease anxiety and depression and reduce the risk of cardiovascular disease and diabetes (Helmrich, Ragland, Leung, & Paffenberger, 1991; Manson et al., 1992), lower blood pressure (Kokkinos et al., 1995), and protect against osteoporosis (Greendale, Barrett-Connor, Edelstein, Ingles, & Haile, 1995) as well as cancer (Meyerhardt et al., 2009; Wolin, Yan, Colditz, & Lee, 2009). Physical activity is even associated with longer life expectancy (Sun et al., 2010). Unfortunately, despite the numerous health benefits of exercise, only about half of all Americans meet the recommended guidelines for aerobic physical activity (meaning 150 minutes a week of moderate-intensity exercise or 75 minutes of vigorous physical activity) (Centers for Disease Control and Prevention, 2017g).

People who live in areas in which they can easily, and safely, walk are more likely to get adequate amounts of physical activity (Cunningham-Myrie et al., 2015; Jilcott Pitts et al., 2015). It is more difficult to maintain healthy exercise habits in neighborhoods without bicycle lanes and sidewalks, a lack of accessible exercise clubs, and fear of crime. Not surprisingly, people who live in walkable urban neighborhoods also show slower increases in rates of overweight, obesity, and diabetes than those living in less walkable ones, even when researchers take into account people's age, area income, and ethnicity (Creatore et al., 2016).

Get Enough Sleep

One of the easiest ways to prevent obesity is to get an adequate amount of sleep. Both sleep quantity and sleep quality influence levels of hormones that regulate appetite, meaning that sleep deprivation can increase feelings of hunger (Knutson, 2012). One recent meta-analysis revealed that people who are sleep-deprived consume about 385 additional calories the next day (Al Khatib, Harding, Darzi, & Pot, 2017). They also consume more fat, and less protein, which over time could lead to obesity. Moreover, and as described in **Focus on Development**, young children who stay up late at night are at greater risk of becoming obese adolescents.

Conclusions

Although preventing obesity is an important goal in terms of improving long-term health, parents need to be careful about the messages they send their children about weight and body image. In some cases, parents' concern about their children's weight can have unintended negative—and lasting—consequences. For example, children whose parents see them as overweight are more likely to develop concerns about their own weight and shape and to engage in unhealthy patterns of eating (such as binging and purging) (Allen, Byrne, & Crosby, 2014; Robinson & Sutin, 2017). They are also more likely to become overweight. Children whose parents see them as overweight gain more weight, perhaps because their parents'

FOCUS ON DEVELOPMENT

How Early Bedtimes Prevent Obesity

Some intriguing research suggests that children who have earlier bedtimes are less likely to become obese as adolescents. Researchers in this longitudinal study examined the bedtimes parents set for their four-and-a-half-year-olds and followed up with these children 10 years later (Anderson, Andridge, & Whitaker, 2016). As they predicted, children with earlier bedtimes were much less likely to become obese as adolescents. Specifically, only 10% of those with a bedtime of 8 p.m. or earlier were obese as 15-year-olds, compared to 16% of those with a bedtime between 8 and 9 and 23% of those who had a bedtime after 9 p.m. These findings are particularly remarkable since the researchers also statistically controlled for socioeconomic status, maternal obesity, and parenting style. In sum, a relatively simple way parents can help prevent obesity is to help their children get enough sleep.

perceptions lead them to feel negatively about their bodies, which can cause stress and unhealthy eating habits, both of which lead to weight gain. Pediatricians therefore recommend that parents emphasize the importance of a healthy lifestyle and not achieving a particular weight (Golden, Schneider, Wood, Committee on Nutrition, Committee on Adolescence, & Section on Obesity, 2016).

Treating Obesity

It is no mystery that weight gain is at least partially a function of taking in more calories than the body burns off. Many people try to lose weight by making changes in their diet—in fact, as much as 25% to 30% of the adult American population is dieting at any one time (Bouchard, 1991). However, the amount of weight people lose on any of these diets tends to be small and temporary. These approaches don't focus on helping people make long-term changes in their dietary habits. It might be that eating only grapefruit for the rest of your life would allow you to maintain a very low body weight, but you would also suffer from various nutritional deficits. It is unrealistic to think that people could maintain health on some dieting approaches. This section describes various strategies that can effectively help people lose weight and maintain such weight loss over time.

Set Short-Term Goals

Setting short-term goals regarding exercise and eating is a great strategy for treating obesity and is more effective than setting longer-term goals (Bandura & Simon, 1977; Marcus et al., 2000; Wadden, 1993). For example, it is better to focus on cutting calories at each meal than on eliminating a certain number of calories each week or jogging three times a week. This type of short-term approach allows people to experience small successes in reaching their larger goals and thus can help them feel more confident in their ability to achieve their weight-loss goals. Setting specific realistic goals and working toward them helps motivation stay high and increases self-efficacy for following through on these behavior change intentions—which is particularly important since self-efficacy is one of the best predictors of whether someone engages in physical activity and adopts healthier eating habits (Anderson, Wojcik, Winett, & Williams, 2006; Fuemmeler et al., 2006; Kitzman-Ulrich, Wilson, Van Horn, & Lawman, 2010).

Similarly, the most effective techniques emphasize gradual weight loss (1 to 2 pounds a week), as opposed to more extreme approaches. The quick and extreme plans that are often featured on magazine covers just don't work—no one can safely lose 10 pounds in the week before spring break. In fact, one recent study examined whether 14 contestants who appeared on *The Biggest Loser* reality television program—and lost an average of 127 pounds during this show—were able to sustain their weight loss after the program ended (Fothergill et al., 2016). Unfortunately, six years later, contestants had regained an average of 90 pounds, in part because the very sudden and extreme weight loss led to a dramatic reduction in their metabolic rate, meaning their bodies simply burn calories more slowly, making weight loss more difficult to sustain.

Create Rewards

As you learned in *Chapter 3: Theories of Health Behavior*, operant-conditioning approaches, in which people receive some type of reward for adhering to a diet, losing weight, or sticking to an exercise program, can be very helpful (Jeffery, Wing, Thorson, & Burton, 1998; Wadden, 1993). For example, you could give yourself some type of reward for successfully meeting your weight-loss goals, such as a new pair of sunglasses or tickets to a concert you've been wanting to see. (Obviously, it's better to not use food as a reward to motivate yourself!) One study found that people who were given rewards (e.g., clothing, money, going to the movies) for engaging in regular exercise reported exercising an average of 2.29 times per week as compared to 1.36 for those who were not given such rewards (Noland, 1989). Operant-conditioning approaches may be especially useful for creating behavior change in children (Epstein, Paluch, Kilanowski, & Raynor, 2004).

Monitor Behavior

Monitoring exactly what, when, and where you eat can help you reduce calories (Wadden, 1993). People sometimes lack an understanding of precisely what they eat each day; therefore, they are confused when their dieting doesn't work. You may, for example, decrease the number of calories you eat at each meal, but if you consistently eat potato chips while you study or have a candy bar as a quick between-classes snack, you may not remember to count those calories. Also, people often overeat in social situations because they aren't even aware of how much they are eating. (Sadly, calories consumed while standing up still count.)

Once you have monitored the factors that lead to overeating, you can try to eliminate these triggers. Instead of stopping at Dunkin' Donuts for coffee and a doughnut on your way to class, you might try eating a bowl of cereal or fruit at home instead. If you eat while you watch TV, you might try eating when sitting at your dining room table with the TV off. Mindful eating is a particular type of self-monitoring that involves paying deliberate attention to what you are eating, including its taste, smell, texture, and so on. People who learn strategies for mindful eating make healthier food choices, which in turn can lead to weight loss (Hendrickson & Rasmussen, 2017). Even simple cues to how much you are eating can help people adopt healthier snacking habits. For example, people eat far fewer potato chips from a tube that contains chips dyed red interspersed at regular intervals that designate how many chips make up a single serving size than from a normal tube without such a visual cue (Geier, Wansink, & Rozin, 2012).

Self-monitoring is more effective if it includes regular prompts and reminders, such as mailings, signs, or phone calls, to keep people on track with the desired changes in their behavior (Anderson, Franckowiak, Snyder, Bartlett, & Fontaine, 1998; Eakin, Reeves, Winkler, Lawler, & Owen, 2010; Lombard, Lombard, & Winett, 1995; Marcus et al., 2000). For example, simply placing a sign saying, "Your heart needs exercise. Here's your chance" increases the number of people taking the stairs instead of the escalator (Brownell, Stunkard, & Albaum, 1980).

Similarly, obese dieters who received reminder calls to self-monitor their eating a couple of times a week didn't gain any weight during the diet-challenging eight-week holiday time (including the Thanksgiving to New Year's weeks), whereas those without these calls gained weight (Boutelle, Kirschenbaum, Baker, & Mitchell, 1999).

Make Small Changes

Other self-control approaches to weight loss focus on helping people make small changes in their behavior, or even in the way that they think about eating and weight loss (Wadden, 1993). Obese people might be encouraged to purchase healthy foods to snack on and to avoid keeping "problem foods" in the house; this way, if they overeat, they eat carrots as opposed to doughnuts. Similarly, people who are dieting may be advised to slow down their eating, perhaps by putting their fork down between each bite or chewing all of their food thoroughly. These methods focus on changing people's negative or unrealistic views about weight loss (e.g., "I will never be able to lose the weight"; "I should have lost the weight by now; this isn't working"). People who have struggled with obesity for some time may view their lack of weight-loss success as a sign of personal weakness and failure, which in turn can lead them to return to unhealthy eating patterns at the first sign of trouble.

People are also more likely to follow through on their intentions to change their eating and exercise habits when these behaviors can easily fit in with their daily lives and schedules. For example, people are more likely to continue exercising when they are exercising at home as opposed to in a health club (Perri, Martin, Leermakers, Sears, & Notelovitz, 1997). Although formal exercise classes can provide social support and motivation, exercising at home is cheaper and more convenient. Similarly, people who commit to engaging in several short bouts of exercise each day (four 10-minute bouts of exercise such as climbing the stairs or walking briskly outside) are more successful at maintaining this behavior than those who attempt to engage in one longer period of exercise such as a 40-minute exercise class (Jakicic, Winters, Lang, & Wing, 1999). Even simple lifestyle changes, such as using stairs rather than escalators, walking rather than driving to work, and parking farther away from store entrances, can be as effective as more organized exercise activities in weight reduction (Andersen et al., 1999; Dunn et al., 1999; Kujala, Kaprio, Sarna, & Koshenvuo, 1998; Wadden et al., 2002).

Get Social Support

Social influence techniques, such as exercising with a friend and participating in formal weight-loss groups, can often help people successfully make changes related to diet and exercise (Duncan & McAuley, 1993; Wadden, 1993; Wing & Jeffery, 1999). For example, one study with overweight adults found that participation in 20 weekly group sessions to encourage dieting and engaging in exercise led to a mean weight loss of 4.4 pounds, with 69% of participants losing at least that much weight (Hollis et al., 2008). Group approaches are especially effective in helping people lose weight because they provide social support as well as healthy competition. For example, rewarding people for the average weight loss in a group leads to greater success at maintaining weight loss over two years than rewarding people for only their own weight loss (Jeffery et al., 1984).

Informal support from family and friends also helps people adopt healthier eating and exercise habits (Anderson et al., 2006; Fuemmeler et al., 2006). For example, a study with adolescents found that having friends, parents, and siblings who support sport activities—and who watch such activities—is associated with more physical activity (Duncan, Duncan & Strycker, 2005). Believing your parents/peers care about your sports and come watch you play is associated with more physical activity. Interventions designed to decrease obesity in children are especially effective if parents are involved and supportive, including changing their own habits and/or assisting with cooking and providing healthier foods (Kitzmann et al., 2010).

Institute Societal Changes

Given the growing awareness of the health consequences of obesity, coupled with its increasing prevalence, a number of cities and states have implemented laws in an attempt to reduce obesity. These included laws requiring posting information on calories and nutrition in restaurants, restricting the sales of unhealthy foods in schools, and increasing taxes on unhealthy foods and drinks (Donaldson et al., 2015). As predicted, towns that increase the tax on sugar-sweetened beverages show reductions in their sales, coupled with increases in sales of other beverages, such as water and milk (Silver et al., 2017).

Researchers in one study examined the effects of posting calorie and nutrition information on purchases at Starbucks in New York City (Bollinger, Leslie, & Sorensen, 2011). Specifically, they compared the calories purchased per transaction and the amount spent before New York City passed a law requiring that such information be posted to assess its impact. As predicted, the number of calories purchased per transaction fell by about 6%, indicating that the law led to some changes in purchasing. Although there was basically no change in the beverage calories purchased, people chose lower-calorie food options following the posting of this information. However, there was no impact on the amount spent per transaction, indicating that posting of calorie information did not reduce sales (as companies often fear).

Utilize Drugs or Surgery

Four drugs have been approved by the United States Food and Drug Administration for use in treating obesity (Apovian et al., 2015; Kakkar & Dahiya, 2015). These drugs—lorcaserin (Belviq), phentermine/topiramate (Qsymia), naltrexone/bupropion (Contrave), and liraglutide (Saxenda)—are used only when other approaches have not been effective in reducing weight, and typically when the person is at risk of experiencing complications, such as diabetes and/or cardiovascular disease, as a result of the weight. Although these drugs can be effective in helping people lose weight, all drugs can have side effects and are thus used only after other approaches to treating obesity have failed.

Finally, in extreme cases, when obesity is a real threat to a person's health, surgical techniques can be used (Kral, 1992). One method is to wire shut a person's jaw for a certain amount of time so he or she can only drink fluids. Other surgical methods include stomach stapling (so that the person can eat only small amounts of food before feeling full) and removal of a portion of the small intestine (which prevents food from being absorbed into the body). Although these approaches often do lead to significant weight loss, they can have unpleasant side effects, including permanent diarrhea and long-term nutritional deficits. These methods are therefore used only in cases of severe obesity that have potentially life-threatening effects.

Conclusions

Obesity is an epidemic within the United States in part because environmental factors, such as the ready availability of cheap unhealthy foods and overall large portion sizes, encourage overeating. Moreover, losing weight, and maintaining that weight loss, is really hard. So, how can people lose weight and maintain that weight loss over time? A 10-year observational study of people who had lost at least 30 pounds, and managed to keep this weight off for at least a year, found that people who were successful showed consistent changes in their behavior (Thomas, Bond, Phelan, Hill, & Wing, 2014). Specifically, these people weighed themselves daily, engaged in regular physical activity, followed a low-fat diet, and avoided overeating. If you'd like to lose weight, try to adopt each of these strategies, and

RICHARD B. LEVINE/Newscom

In June 2016, Philadelphia became the second city in the United States to increase taxes on sugar-added and artificially sweetened soft drinks, which research suggests will decrease their consumption. This tax will add 18 cents to the cost of a can of soda, $1.08 to a six-pack, and $1.02 to a 2-liter bottle.

remember that engaging in regular exercise—even if it doesn't result in weight loss—is good for psychological and physical well-being.

UNDERSTANDING DISORDERED EATING

This section of the chapter is particularly difficult to write—and perhaps to read—because many students may feel personally impacted by some type of disordered eating. I remember attending summer camp one year when I was in high school and hearing a close friend talk about consuming over a gallon of ice cream and then vomiting it up. I remember watching a girl in high school jog around the school every day at lunchtime, getting thinner almost literally before my eyes. I remember staying overnight with a friend during college and seeing cookie crumbs beside the toilet. In this section, you'll learn about different types of eating disorders, psychosocial factors influencing their development, and strategies for both preventing and treating such disorders. But most important, keep in mind that disordered eating is a serious problem, and therefore it is really important to seek help if you or someone you know is engaging in these behaviors.

Types of Eating Disorders

Although all eating disorders involve some type of dysfunctional and unhealthy pattern of eating, the specific characteristics of various disorders differ substantially. This section describes the three most common types of disordered eating.

Anorexia Nervosa

Anorexia nervosa involves a drastic reduction in a person's food intake and an intentional loss of weight (maintaining a body weight 15% below one's normal weight based on height/weight tables, or a BMI of 17.5; American Psychiatric Association, 2013). This loss of weight eventually leads to amenorrhea, the absence of menstruation. People with anorexia nervosa are intensely focused on achieving and maintaining a very thin body size and have an excessive fear of gaining weight (see Table 8.3). They also overestimate their own body weight and thus see themselves as heavy even when they are actually quite thin (Hagman et al., 2015). Unfortunately, these dysfunctional body shape and size ideals lead them to engage in unhealthy patterns of eating and exercise. They typically eat only very small amounts of food (e.g., a Cheerio for breakfast, a bite of an apple for lunch, lettuce for supper) and may have a variety of eating rituals that they engage in as a way of avoiding eating (e.g., cutting food into very small portions, eating very slowly). People with anorexia may also engage in strenuous exercise in an effort to lose weight.

Anorexia is much more common in women than men and tends to be most prevalent in upper-middle-class and upper-class White women. Women who participate in weight-conscious activities, including ballet, gymnastics, and modeling, are at greatest risk of developing anorexia. Although the overall prevalence of anorexia nervosa in all women in the United States is approximately 1% (only 0.3% for men) (Hudson, Hiripi, Pope, & Kessler, 2007), some estimates suggest that 6% to 7% of women who attend professional schools for modeling and dance meet the criteria for having anorexia (Garner & Garfinkel, 1980).

Most important, anorexia can lead to very serious, in some cases life-threatening, problems; in fact, an estimated 4% of people with anorexia will die from this disease, which is the highest mortality rate among all psychiatric disorders (Crow et al., 2009; Kask et al., 2016). Anorexia can cause low blood pressure, heart damage, and cardiac arrhythmia, which in turn can lead to heart failure (Brownell & Fairburn, 1995; Comerci, 1990). Moreover, women who recover from anorexia still may suffer from long-term problems, including bone loss (because of undernutrition and amenorrhea) and infertility (Becker, Grinspoon, Klibanski, & Herzog, 1999).

Table 8.3 Diagnostic Criteria for Eating Disorders

Anorexia Nervosa

1. Restriction of energy intake relative to requirements, leading to a significantly low body weight in the context of age, sex, developmental trajectory, and physical health. Significantly low weight is defined as a weight that is less than minimally normal or, for children and adolescents, less than that minimally expected.

2. Intense fear of gaining weight or of becoming fat, or persistent behavior that interferes with weight gain, even though at a significantly low weight.

3. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or persistent lack of recognition of the seriousness of the current low body weight.

Bulimia Nervosa

1. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:
   - Eating, in a discrete period of time (e.g., within any two-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances.
   - A sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating).

2. Recurrent inappropriate compensatory behavior to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, enemas, or other medications; fasting; or excessive exercise.

3. The binge eating and inappropriate compensatory behaviors both occur, on average, at least once a week for three months.

4. Self-evaluation is unduly influenced by body shape and weight.

5. The disturbance does not occur exclusively during episodes of anorexia nervosa.

Binge Eating Disorder

1. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:
   - Eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than what most people would eat in a similar period of time under similar circumstances.
   - A sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating).

2. The binge-eating episodes are associated with three (or more) of the following:
   - Eating much more rapidly than normal.
   - Eating until feeling uncomfortably full.
   - Eating large amounts of food when not feeling physically hungry.
   - Eating alone because of feeling embarrassed by how much one is eating.
   - Feeling disgusted with oneself, depressed, or very guilty afterward.

3. Marked distress regarding binge eating is present.

4. The binge eating occurs, on average, at least once a week for 3 months.

5. The binge eating is not associated with the recurrent use of inappropriate compensatory behavior as in bulimia nervosa and does not occur exclusively during the course of bulimia nervosa or anorexia nervosa.

Source: Reprinted with permission from the *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition (Copyright © 2013). American Psychiatric Association. All Rights Reserved.

Bulimia Nervosa

Bulimia nervosa is characterized by recurrent episodes of binge eating followed by purging (see Table 8.3; American Psychiatric Association, 2013). These episodes are typically triggered by some type of negative emotion, such as anxiety, tension, or even tiredness. During binges, bulimics rapidly consume enormous quantities of food. They typically select binge foods that are easy to swallow and vomit—fatty, sweet, high-energy foods. Bulimics then attempt to get rid of these calories, typically through vomiting or excessive exercise. This pattern of binge eating and purging occurs on a regular basis over some period of time. Bulimia is easier to hide than anorexia, in part because people with bulimia are typically normal weight. Although bulimia has a prevalence rate of approximately 1.5% in American women (0.5% in American men; Hudson et al., 2007), some surveys indicate that as many as 10% of women in college show symptoms of bulimia (Becker et al., 1999).

Bulimia can also cause a variety of medical problems, which are a result of the use of specific types of purging behaviors (e.g., vomiting and laxative use) (Comerci, 1990; Mehler, 2010; Mehler & Rylander, 2015). Frequent vomiting may cause tearing and bleeding in the esophagus, burning of the throat and mouth by stomach acids, and damage to tooth enamel. Frequent purging can also lead to deficiencies in various nutrients as well as anemia (an insufficient number of red blood cells), which both cause weakness and tiredness). An estimated 3.9% of people with bulimia die from this disorder, in part due to an increased rate of suicide (Crow et al., 2009). One study of over 10,000 adolescents and nearly 3,000 adults found that 53% of those with bulimia had thoughts about suicide (Crow, Swanson, Grange, Feig, & Merikangas, 2014).

Binge Eating Disorder

Although anorexia and bulimia are the most widely known disorders, the most common eating disorder is **binge eating disorder** (Hudson et al., 2007; Swanson, Crow, le Grange, Swendsen, & Merikangas, 2011). This disorder is characterized by repeatedly eating large quantities of food, often very quickly and to the point of discomfort, and feeling out of control during these episodes (see Table 8.3; American Psychiatric Association, 2013). People with binge eating disorder typically feel negative emotions, such as shame, distress and/or guilt, for their binge eating. An estimated 3.5% of females and 2% of males report having binge eating disorder at some point in their lives.

Not surprisingly, binge eating disorder often leads to obesity, and is prevalent in up to 30% of those seeking weight loss treatment. Binge eating can also lead to serious medical consequences. Consuming large quantities of food can cause damage to the stomach and intestines (Brownell & Fairburn, 1995) as well as hypoglycemia, which is a deficiency of sugar in the blood: following a binge of sweets, the pancreas releases excessive amounts of insulin, which drives down blood sugar levels and can leave a person feeling dizzy, tired, and depressed. Binge eating disorder may also cause disturbances to the metabolic system, which can lead to weight gain (Mitchell, 2015). Perhaps most important, more than a third of people with binge eating disorder have thoughts about suicide (Crow et al., 2014).

Subclinical Eating Disorders

Although relatively few people meet the diagnostic criteria for an eating disorder, many people, especially women, engage in some type of disordered eating. An estimated 4.4% of adolescents report having symptoms of disordered eating that do not reach clinical proportions (Swanson et al., 2011). Similarly, although relatively few people meet the diagnostic criteria for an eating disorder (only 2.9% of females and 0.01% of males), 11.5% of females and 1.8% of males ages 14 to 24 show at least some key symptoms of an eating disorder (Nagl et al., 2016). One study of college students found that 13.5% of women and 3.6% of men

show some symptoms of disordered eating, such as losing substantial weight, believing they are fat when others describe them as too thin, and feeling that food dominates their life. And disordered eating occurs throughout the lifespan; an estimated 2 million adult women report using unhealthy strategies to lose weight, including fasting, vomiting, using diet pills, and taking laxatives (Biener & Heaton, 1995).

Common Features of Eating Disorders

Although the specific symptoms differ between those with anorexia, bulimia, and binge eating disorder, they also share some distinct similarities. First, people with eating disorders tend to overvalue the role of appearance and see themselves in very self-critical ways (Duarte, Ferreira, & Pinto-Gouveia, 2016). People with anorexia often believe that one must be attractive to be successful, and evaluate extremely thin women as more attractive and normal-weight women as less attractive, compared to women without anorexia (Hartmann et al., 2015; Horndasch et al., 2015). For example, one study of women with anorexia or bulimia found that when looking in a mirror, they spent more time looking at their most dissatisfying body parts than their more satisfying ones, whereas people without such a disorder show a more balanced looking pattern (Tuschen-Caffier et al., 2015).

Evidence also suggests that people with eating disorders may have difficulty understanding and regulating their emotions, and may engage in particular behaviors—such as binge-ing, purging, and excessive food restriction—as a way of managing distressing emotions (Lavender et al., 2015). Specifically, people who experience stress show increases in negative affect, which in turn leads to disordered eating behaviors, including binge eating, and purging (Goldschmidt et al., 2014; Ivanova et al., 2015). In line with this view, people with binge eating disorder report a greater number of traumatic events—such as bereavement, accidents, and separation from a family member—in the six months preceding the start of their disorder than do people without this disorder, revealing more often three types of events: bereavement, separation from a family member, and accidents (Degortes et al., 2014). Lab-based research finds similar results; women who experience stress in a lab-based setting report increases in drive for thinness and bulimic symptoms (Sassaroli, Fiore, Mezzaluna, & Ruggiero, 2015).

Michael Tran/Getty Images

In 2016, actress and singer Demi Lovato checked into a treatment center to get treatment for bulimia. Both her mother and grandmother had also struggled with this eating disorder.

The Role of Genetics

Biological factors may influence the likelihood of developing an eating disorder (Allison & Faith, 1997; Hewitt, 1997). First, women who have a close relative who suffers from an eating disorder are two to three times more likely to experience anorexia or bulimia than are women without this link. Second, twin studies have shown that these disorders are much more likely to appear in both twins of an identical pair than in fraternal twins. For example, one study examined rates of bulimia in over 2,000 female twins and found that genetic factors may predict bulimia in nearly 55% of cases (Kendler et al., 1991). Similarly, some evidence suggests a genetic link to binge eating disorder; people with a particular variation of a gene linked to both binge eating disorder and obesity are 20% to 30% more likely to binge-eat than people without this gene (Davis, 2015; Micali, Field, Treasure, & Evans, 2015).

People with eating disorders may have impairments in brain neurochemistry that lead to dysfunctional eating patterns. For example, bulimics are less sensitive to serotonin, which

cues feelings of fullness, than people with normal eating patterns (Sunday & Halmi, 1996). So, bulimics may eat huge amounts of food because they are unable to recognize feelings of fullness as quickly as others. On the other hand, anorexics show abnormally high levels of serotonin as well as leptin (which regulates eating) (Walsh & Devlin, 1998). However, because these findings are correlational, it is not clear whether abnormal levels of serotonin produce disordered eating or perhaps are caused by disordered eating. One possibility is that these physiological changes are initially caused by irregular eating patterns, but then maintain these irregularities. For example, anorexics have low levels of leptin, which is secreted by fat cells, because they have such low levels of body fat. However, when anorexics increase how much they are eating, their leptin levels climb more quickly than their weight gain, making them feel full too early (hence less able to gain appropriate amounts of weight).

Finally, exposure to particular sex hormones during the fetal period may increase the risk of developing anorexia (Procopio & Marriott, 2007). Moreover, although the risk of developing anorexia in female twins is higher than in male twins, males with a female twin have a higher risk of developing anorexia than other males. In fact, their risk is at a level that is not statistically significantly different from that of females from such a pair. One explanation for males with a female twin's increased risk of anorexia is that some type of hormonal substance is produced during pregnancy with a female fetus that increases the risk of developing anorexia. In turn, this would explain not only the generally greater risk for females than males of developing anorexia but also the greater risk for males with a female twin.

PSYCHOSOCIAL FACTORS CONTRIBUTING TO DISORDERED EATING

LO 8.5

Explain how psychosocial factors contribute to disordered eating

Most research indicates that psychological factors are heavily involved in the acquisition of eating disorders. This section therefore examines how media images, sociocultural norms, personality, and family interactions can contribute to disordered eating.

Media Images

Think quickly—who is the most attractive female movie star? I don't know who you named, but I bet she's very thin. Virtually all media images of women in the United States, including women in movies, on television shows, in music videos, and on the covers of magazines, show very thin women—some would say even dangerously thin: Miss America contestants have body weights 13% to 19% below the expected weight for women of their height (Wiseman, Gray, Mosimann, & Ahrens, 1992), which is one criterion for diagnosing anorexia.

The thinness norm portrayed in media is actually relatively new. Marilyn Monroe, the most revered sex symbol of the 1940s and 1950s, would be considered obese by our current standards. Movie and magazine depictions of women have become consistently thinner in the past 20 years (Silverstein, Perdue, Peterson, & Kelly, 1986). For example, between 1959 and 1978, the weight of Miss America contestants and Playboy centerfolds decreased significantly (Garner, Garfinkel, Schwartz, & Thompson, 1980). Similarly, over the last 20 years, women's magazines have increased the number of articles on weight-loss techniques, presumably in an attempt to "help" women reach this increasingly thin ideal (Andersen & DiDomenico, 1992; Garner et al., 1980). However, and as described in **Research in Action**, exposure to Western media influences preference for such a thin ideal.

Not surprisingly, the presence of such thin women in the media often leads women of normal weight to feel too heavy. Nearly half of women of average weight are trying to lose weight (Biener & Heaton, 1995), as are 35% of normal-weight girls and 12% of

underweight girls (Schreiber et al., 1996). One study of teenage girls found that the "ideal girl" was perceived to be 5 feet, 7 inches tall and 100 pounds (translating into a BMI of less than 16, which is anorexic) (Nichter & Nichter, 1991). Repeated exposure to the extremely thin ideals presented by the media may also lead some women to develop more negative attitudes about their own bodies and can trigger disordered eating behaviors, such as binge eating and vomiting, in women with anorexia (Heinberg & Thompson, 1995; White et al., 2015).

Sociocultural Norms

Given the prevalence of the thinness norm, and its clear association with femininity and attractiveness, women often believe that they must be thin in order to appeal to potential dating partners. In fact, both men and women rate thin women as more feminine and attractive than normal-weight or overweight women (Silverstein et al., 1986), and being thinner is often associated with greater success in dating (Paxton et al., 1991). For example, although the average high school girl is 5 feet, 3 inches tall and 126 pounds, girls of this height who weigh 110 pounds are twice as likely to be dating, and girls who weigh 140 pounds are only half as likely to be dating (Halpern, Udry, Campbell, & Suchindran, 1999). In turn, women often eat less in front of desirable dating partners than in front of undesirable partners in an attempt to appear attractive (Mori, Chaiken, & Pliner, 1987).

Thinness in women is associated not only with greater success in dating but also with general popularity with both men and women. Thinner girls and "average" boys (not too thin, not too heavy) are seen as more popular by their high school peers (Wang, Houshyar, & Prinstein, 2006). Similarly, high school girls who attend school with a higher percentage of female students have higher rates of eating disorders, suggesting that other girls may also influence the development of unhealthy patterns of eating and body ideals (Bould et al., 2016). Relatedly, a study of women who lived in a sorority revealed that those who engaged in more frequent bulimic behavior were more popular than those who engaged in such behavior less frequently, presumably because engaging in this behavior indicates a desire to conform to the thinness norm (Crandall, 1988).

Sociocultural norms for thinness are often communicated via social media, which can have negative consequences on how women feel about their own bodies. For example, researchers

in one study examined whether the use of social media was associated with greater feelings of body dissatisfaction (Mabe, Forney, & Keel, 2014). College women were asked to rate how much time they spent on Facebook, how important receiving "likes" for their posts was, and whether they frequently compared their photos to those of their friends. As predicted, simply spending about 20 minutes on Facebook was associated with greater increases in anxiety as well as weight and shape concerns than spending time on the Internet in other ways. Women who spent more time on Facebook reported more symptoms of disordered eating.

Sadly, even girls as young as three to five show signs of adopting the thin ideal (Harriger, Calgero, Witherington, & Smith, 2010). When preschool girls were asked to select which of three body figures (one thin, one average, one fat) they would most like for their best friend, 71% chose the thin figure and only 7.3% chose the fat figure. Researchers then asked the girls to play a game of Candy Land or Chutes and Ladders and to choose which of the body figures they would like to be for the game. Once again, 69% chose the thin piece and only 11% chose the fat piece. This research suggests that this preference for the thinness norm emerges very early in life. However, and as described in **Focus on Diversity**, this preference varies as a function of culture, social class, and race/ethnicity.

What You'll Learn
8.4

FOCUS ON DIVERSITY

The Thin Ideal Is Not Universal

Although in the United States the thin ideal has taken hold, this preference is by no means universal. One large cross-cultural study revealed that less socioeconomically developed countries generally show a stronger preference for heavier figures compared to more developed countries (Swami et al., 2010). This finding is in line with that from prior research showing that in societies in which food is scarce, the ideal female body type is heavy, perhaps because women who are heavier are perceived as healthy and more fertile, and heaviness can be a sign of wealth (Anderson, Crawford, Nadeau, & Lindberg, 1992). For example, in cultures with a very reliable food supply, such as the United States, 40% of people prefer a very thin female body, whereas only 17% show such a preference in cultures with fairly low reliability of food and no cultures show such a preference in cultures with very low reliability of food. Finally, this research revealed that women in more socioeconomically developed countries have higher body dissatisfaction than those in less developed countries. Greater exposure to Western media was also associated with a stronger preference for a thinner figure, suggesting that the very thin images of women in typical Western media portrayals may in fact lead to greater adoption of the thinness norm

as well as higher levels of body dissatisfaction. In line with this view, rates of eating disorders have increased substantially in many Asian countries as Western influences, including media, industries, and technology, have spread into the Asian continent (Pike & Dunne, 2015).

Even within the United States, ethnic groups vary on how much emphasis they place on the thin ideal (Halpern et al., 1999). Adolescent girls from higher socioeconomic status backgrounds have more awareness of the thin ideal and more family/friends who are trying to lose weight (Wardle et al., 2004). They also see a lower BMI as "fat" and are more likely to use weight-control methods, such as not eating particular foods. In fact, compared to White girls and women, Blacks have a heavier ideal weight, are less preoccupied with weight and dieting, and are more satisfied with their weight (Desmond, Price, Hallinan, & Smith, 1989). Similarly, Mexican American women who are higher in acculturation, meaning orientation toward American culture, show higher rates of disordered eating than those who are oriented toward Mexican culture, as do Latino women who have lived a greater percentage of their lives in the United States (Alegria et al., 2007; Cachelin, Phinney, Schug, & Striegel-Moore, 2006).

Boys and men may feel pressure to conform to the muscular male body type seen in professional athletes.

Although most research on social pressures leading to body image dissatisfaction has focused on the prevailing thin ideal for women, men may also feel pressure to conform to a similarly unrealistic body image norm (Pope, Olivardia, Gruber, & Borowiecki, 1999). However, the male ideal focuses on achieving a muscular ideal. To test the evolution of the "muscular male ideal" over time, researchers examined the measurements of the GI Joe action toy (the action toy with the longest continuous history) produced in 1973, 1975, and 1994. This review revealed a disturbing trend: the GI Joe action figure became much more muscular over time. For example, although there was no change in the height of the action figure, the biceps increased from 2.1 inches (1973) to 2.5 inches (1975) to 2.7 inches (1994). These may seem like small differences, but when translated into measurements for adult male bodies, bicep size would have increased from 12.2 inches to 16.4 inches. The latest GI Joe (the GI Joe Extreme, introduced in 1998) has biceps that translate to 26.8 inches—larger than any bodybuilder in history.

Finally, although the cultural norms in most Western societies seem to support a very thin ideal for women, these norms are not as extreme as people think. In fact, college women's ideal figure is significantly smaller than their current figure (Fallon & Rozin, 1985). In contrast, the gap between men's current and ideal figure is quite small! Women also typically believe men prefer a female figure that is thinner than men actually do. Similarly, my own research has shown that women believe other women are more supportive of the thinness norm than these women actually are (Sanderson, Darley, & Messinger, 2002). For example, women have an average BMI of 22 but believe other women have a BMI of about 20.5, and women exercise about 4 hours a week but believe other women exercise about 5.5 hours a week. Sadly, however, women who feel discrepant from the campus thinness norm—even if such a perception is inaccurate—have a greater frequency of symptoms of eating disorders, such as an extreme focus on thinness, binge eating, and purging.

Family Dynamics

Parents can influence their children's eating behaviors. First, families of women with eating disorders may also be particularly focused on weight and shape. In fact, girls who believe it is important to their parents that they are thin are more likely to be concerned about their weight and to diet than those who do not believe their parents have such preferences (Field et al., 2001). Women whose mothers are preoccupied with weight and dieting behaviors and who criticize their daughters' appearance also report more weight-loss behaviors themselves (Baker, Whisman, & Brownell, 2000; Sanftner, Crowther, Crawford, & Watts, 1996). For example, one study with 89 pairs of mothers and their teenage daughters found that girls who use extreme weight-loss methods (e.g., fasting, crash dieting, skipping meals) are very likely to have mothers who also use such methods (Benedikt, Wertheim, & Love, 1998). Although they may not be directly encouraging their daughters to engage in such behaviors, these mothers are still modeling these attitudes and behaviors. Moreover, while only 14% of the girls in this sample were overweight, 51% of the mothers reported that they encouraged their daughters to lose weight and 39% of the mothers wanted their daughters to be thinner. Mothers who are preoccupied with their own weight are more likely to restrict what their daughters eat and encourage them to lose weight, which in turn leads, over time, to daughters' restrained eating (Francis & Birch, 2005).

On the other hand, families who regularly have meals together tend to have children with lower rates of disordered eating behavior. Specifically, adolescents who report more frequent family meals (as well as making eating as a family a priority, having a positive atmosphere at family meals, and having a more structured family meal environment) are less likely to engage in extreme unhealthy weight control behaviors (Neumark-Sztainer, Wall, Story, & Fulkerson, 2004). For example, 18.1% of girls who reported eating only one or two meals as a family engaged in extreme weight control behaviors, such as vomiting, taking diet pills, and using laxatives/diuretics, compared to 8.8% of girls who reported eating three or four meals a week as a family. In fact, making family meals a priority, even given difficulties in scheduling, was the strongest predictor of rates of disordered eating behavior. The association between more frequent family meals and rates of disordered eating behaviors was stronger for girls than for boys.

The families of anorexics often have some distinct, potentially dysfunctional, dynamics (Kog & Vandereycken, 1985). They may appear normal, and even high achieving, from the outside, but family members have problems with engaging in open communication and managing conflict. Parents also tend to be overinvolved in their daughters' lives and may be demanding and controlling—they often do not encourage autonomy or assertiveness in their children. One study of anorexic patients found that they typically describe their parents as setting extremely high achievement standards and as being often disapproving (Waller & Hartley, 1994).

The families of bulimics also often show particular characteristics, including more conflict and hostility coupled with less nurturance and support within the family group (Wonderlich, Klein, & Council, 1996). Women with bulimia may binge and purge to cope with feelings of isolation and stress, in part because they are unlikely to have supportive interpersonal relationships in their families. Women with bulimia also feel less socially competent in a variety of ways, including in their ability to form close relationships and function well socially (Grisset & Norvell, 1992). They are also rated by observers as less socially effective, including being worse at problem solving, less likely to be a good friend, and less skilled in social interaction.

People with bulimia are more likely to report that their family emphasized keeping in shape and maintaining a low weight. For example, people with bulimia report higher rates of obesity in childhood and adolescence, coupled with parental disapproval of their weight, which may trigger dysfunctional eating patterns (Gonçalves, Machado, Martins, Hoek, & Machado, 2016; Machado et al., 2015).

Personality

Anorexics often have a distinct personality style—they are rigid, anxious, perfectionistic, and obsessed with order and cleanliness (Kaye, 1997). In fact, anorexics have high rates of diagnosis with obsessive-compulsive disorder. Anorexics hold themselves to particularly high standards; hence, they may seem like "the perfect child" to outside observers (Tiller, Schmidt, Ali, & Treasure, 1995). Often they have assimilated a very thin ideal. For example, when asked to judge the weight at which their own bodies and other women's bodies would change from "thin" to "normal" to "fat," anorexics give lighter weights for each of the transition points than do normal weight women, indicating that they set particularly strict standards for attractiveness (Smeets, 1999). These personality characteristics may not be simply a result of their current eating disorder, and hence a reflection of malnutrition, because recovered anorexics who are of normal weight show similar traits.

Women who have bulimia have quite a different set of personality characteristics than those who develop anorexia. Bulimics are often depressed and anxious, leading some researchers to believe that they use food as a way of comforting themselves. Bulimics have often struggled with weight issues for some time and may have a history of binge eating, weight fluctuation, and frequent exercise or dieting (Kendler et al., 1991). Bulimics may lack a clear sense of self-identity or have very negative self-views (Humphrey, 1986, 1988). While

anorexia involves extreme levels of control, bulimics typically report feeling out of control while they are binge eating, resulting in guilt and self-contempt following such episodes. Two studies suggest that 20% to 33% of bulimics who are in treatment have made at least one serious suicide attempt (Garfinkel & Garner, 1984). Women with bulimia report higher levels of other types of destructive behaviors, including alcohol use, substance abuse, and kleptomania (compulsive stealing), than women without an eating disorder (Holderness, Brooks-Gunn, & Warren, 1994). Bulimics are also more likely to have experienced sexual abuse during childhood (Wonderlich, Wilsnack, Wilsnack, & Harris, 1996).

Although binge eating disorder (BED) has only recently been identified as a distinct disorder, and thus relatively little research has examined how personality factors are associated with its development, some research suggests that people with BED have more general difficulties in controlling impulses, even those not related to food (Manasse et al., 2015). In turn, people with BED may be particularly likely to engage in unhealthy eating behaviors in response to stress. To test this hypothesis, researchers examined predictors of binge eating in a sample of female twins (Racine et al., 2015). Fourteen percent of these women reported engaging in unhealthy patterns of eating, including binge eating, overeating, or feeling a loss of control over eating. Women with these eating patterns generally were higher in impulsivity, meaning a tendency to act rashly or on a whim. They may therefore be responding to negative emotions, such as stress, by binge eating because they feel unable to manage these unpleasant feelings in a healthier way.

REDUCING DISORDERED EATING

Given the very serious, even fatal, consequences of eating disorders, reducing the rates of such disorders is essential. This section will describe efforts to prevent the development of disordered eating behaviors as well as the treatment of such disorders.

Preventing Disordered Eating

Because eating disorders are so prevalent and so problematic, some high schools and most colleges and universities have programs designed to prevent such problems by giving students knowledge about the hazards of disordered eating in the hopes that having such information will help prevent serious disorders. Unfortunately, research on the effectiveness of such programs has yielded somewhat mixed findings. For example, in one study, sixth- and seventh-grade girls were randomly assigned to receive either 18 hour-long lessons on eating disorders or their regular health class (Killen et al., 1993). The lessons included information on normal growth and development, the dangers of unhealthy dieting strategies, the influence of media images, and strategies for healthy eating and exercise. Although girls who received this intense information did have higher scores on knowledge of eating behavior than those without this program, they did not show changes in their concern about weight.

Other research even points to the potential of disordered eating prevention efforts leading to unintended negative consequences. A study by Mann and colleagues (1997) evaluated the effectiveness of an eating disorder prevention program that was presented to 788 first-year women attending Stanford University. Contrary to expectations, women who attended this program actually had more symptoms of disordered eating one month after than those who did not attend the program, perhaps because the programs inadvertently taught participants strategies for engaging in unhealthy methods of weight loss. This research suggests that eating-disorder prevention programs must be very careful to avoid causing unintended harm to participants.

Fortunately, programs that emphasize the importance of engaging in healthy eating and exercise behaviors and teach strategies for critiquing media images of women can help prevent disordered eating behaviors.

Emphasize Healthy Eating, Exercise, and Body Image

Programs focusing on healthy eating, exercise, and body image can help reduce the likelihood of developing eating disorders. Prevention programs using this approach teach participants about various factors that influence weight and help them make healthy improvements to their current eating and exercise habits (Stice, Marti, Spoor, Presnell, & Shaw, 2008). Such programs lead to decreases in body dissatisfaction and symptoms of eating disorders in high school girls and reduce participants' likelihood of developing an eating disorder as long as two to three years later. Moreover, learning skills and strategies for engaging in healthy eating and exercise may protect high school girls from becoming obese. For example, adolescent girls who participated in a healthy-weight group (which focused on eating a balanced dieting and engaging in regular exercise) showed greater decreases in bulimic symptoms at the one-year follow-up than those in the control group (Stice, Presnell, Groesz, & Shaw, 2005). In addition, girls in the control condition were more likely than girls in the healthy-weight condition to become obese over time; at the one-year follow-up, only 1.2% of girls in the healthy-weight condition had become obese compared to 11.4% of girls in the control condition. These findings suggest that participation in a healthy-weight group protects girls from the increases in weight seen in those in the control condition.

Encouragingly, the benefits of such an intervention can be realized using entirely Internet-based approaches. College women who receive Internet-based programs that provide information related to body image and healthy eating—including information on the thin ideal in the media, emotional eating, and the "freshman 15"—show lower levels of overeating and excessive exercise, increases in body satisfaction, and fewer symptoms of disordered eating (Franko et al., 2005; Winzelberg et al., 2000). These programs also lead to decreases in symptoms of disordered eating. Encouragingly, this type of Internet-based intervention is particularly effective in terms of reducing the risk of developing an eating disorders for women at high risk for developing such a disorder (Jacobi et al., 2007).

Critique Media Images

As described previously, thin images of women in the media can contribute to disordered eating. In turn, programs that help people learn to critique the thin ideal can help prevent disordered eating (Becker, Bull, Schaumberg, Cauble, & Franco, 2008; Stice, Chase, Stormer, & Appel, 2001; Stice, Mazotti, Weibel, & Agras, 2000; Stice, Shaw, Burton, & Wade, 2006). Many such programs are based in **cognitive dissonance theory**, which proposes that when people's thoughts are inconsistent with their behavior or two thoughts are in conflict, they experience unpleasant physiological arousal and in turn will change their behavior or thoughts to restore consistency. Women who publicly critique the dangerously thin images of women in the media may therefore change their own idealization of the thinness norm as well as unhealthy efforts to achieve this norm. Dissonance-based interventions lead to reductions in eating disorder symptoms in both college women (Stice, Rohde, Butryn, Shaw, & Marti, 2015) and high school girls (Stice, Rohde, Shaw, & Gau, 2011). In fact, findings from one study revealed that participation in such a program led to a 60% reduction in the likelihood of developing an eating disorder several years later (Stice et al., 2008).

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Intervention programs that help participants understand, and critique, the false images of thin women in the media, such as the airbrushed version on the left above, can help reduce body dissatisfaction as well as symptoms of disordered eating.

For example, researchers in one study assigned high school girls to one of two groups (Stice, Rohde, Gau, & Shaw, 2009). Girls in the cognitive dissonance intervention group discussed the nature, origins, and continuation of the thin ideal; wrote a letter to a younger girl discussing the costs of this ideal; and developed strategies for coping with and countering this ideal. Girls in the control condition simply received an educational brochure about negative and positive body image. Researchers then examined the impact of each condition over the next year. As predicted, findings indicated that girls in the dissonance intervention reported greater decreases in idealization of the thinness norm, body dissatisfaction, dieting, and eating disorders symptoms. Moreover, 42% of those in the dissonance intervention reported clinically significant reductions in symptoms of disordered eating a year later, compared to only 24% of those in the brochure condition. This research provides strong evidence that programs that help girls critique the thin ideal may reduce rates of disordered eating. Moreover, and as described in **Focus on Neuroscience**, participating in such an intervention changes how the brain responds to thin images of women in the media.

Dissonance-based interventions can also be effective if delivered via the Internet, which increases their ability to reach more people. However, group-based interventions are more effective than those delivered entirely on the computer (Stice, Durant, Rohde, & Shaw, 2014). For example, one recent study compared the effects of two distinct types of group-led dissonance interventions (one led by clinicians, one led by peers) to those of an Internet-delivered intervention (Stice, Rohde, Shaw, & Gau, 2017). Although women in the Internet-delivered intervention showed greater reductions in eating disorder symptoms than those in the control condition, who simply watched an educational video, they showed smaller reductions than those in either of the two group-based interventions.

Treating Disordered Eating

Although eating disorders are obviously associated with serious health consequences, people with such disorders are often very reluctant to seek treatment (Pike & Striegel-Moore, 1997). They may feel ashamed and embarrassed to admit their behavior and may believe that the

FOCUS ON NEUROSCIENCE

How Exposure to Healthy Body Images Changes the Brain

To examine the effects of dissonance-based eating disorders prevention education, researchers compared patterns of brain activation in women at risk of developing an eating disorder both before and after receiving such education (Stice, Yokum, & Waters, 2015). First, women viewed photos of both thin- and average-sized women while in an fMRI machine. Next, they were randomly assigned to receive either a standard dissonance-based eating disorders prevention program, in which they discussed the costs of pursuing the thin ideal in a group, or an educational brochure. Participants then again viewed both thin- and average-sized images of women while in an fMRI. Initial findings revealed that a part of the brain that processes rewarding experiences was activated when seeing the thin images of women, suggesting that seeing these images causes a positive neurological reaction. However, after exposure to a dissonance-based intervention, women's brains instead showed greater activation in the reward center in response to images of average-sized, healthy women than in response to those of the very thin women. These findings provide objective evidence that dissonance-based messages lead to changes in how the brain responds to thin images of women, which helps explain why such education helps reduce disordered eating.

disorder will simply go away on its own at some point. While bulimics often feel out of control, depressed, and guilty about their eating habits, and hence are motivated to get better, anorexics typically feel in control and even proud of their highly restricted eating habits and hence often resist treatment. People with anorexia may also be afraid that seeking treatment will lead them to gain weight. And in some cases, this is true—because people with anorexia often seek help (or, more often, are forced to seek help) only when they are on the verge of collapsing from starvation, tube or intravenous feeding may be used (in a hospital setting) to try to get their body weight and nutrition under control (Goldner & Birmingham, 1994).

A few approaches can help in treating eating disorders, including cognitive-behavioral therapy, family-based therapy, and drug therapy.

Cognitive-Behavioral Therapy

Cognitive-behavioral therapy may be effective in treating both anorexia and bulimia (Accurso et al., 2016; Knott, Woodward, Hoefkens, & Limbert, 2015; Walsh & Devlin, 1998). This type of therapy focuses on normalizing patients' eating patterns (by encouraging slow eating, regular meals), expanding their food choices (by eliminating "forbidden" foods), and changing their thoughts and attitudes about eating, food, and their bodies (by trying to avoid linking self-esteem with weight). Techniques can include monitoring the thoughts, feelings, and circumstances that lead to binge eating and purging and clarifying distorted views of eating, weight, and body shape. For example, therapists may use cognitive-behavioral therapy to attempt to change faulty beliefs, such as "If I gain one pound, I'll gain a hundred," and "Any sweet is instantly converted into fat." They teach patients that media images of women are often illusions (e.g., models often have their body flaws airbrushed away) as a way of helping them develop more realistic body ideals. Cognitive-behavioral therapy for bulimia is especially effective when coupled with antidepressant drugs, such as Prozac.

Cognitive-behavioral therapy is typically more effective than therapeutic approaches that simply provide listening and support. For example, researchers in one study compared the effectiveness on bulimia of two types of therapy (Garner, Rockert, & Davis, 1993). Sixty bulimic women, ages 18 to 35 years, were randomly assigned to receive either cognitive-behavior or supportive-expressive therapy over 18 weeks, with one 45- to 60-minute session each week. The cognitive-behavior therapy consisted of self-monitoring of food intake, vomiting, and binge eating, as well as monitoring feelings and thoughts surrounding eating. Supportive-expressive therapy, which views eating disorders as a symptom of larger problems, had therapists listen to and help clients identify feelings. Both treatments were equally effective in decreasing the frequency of binge eating, but cognitive-behavior therapy was somewhat better in decreasing the frequency of vomiting (82% reduction versus 64% reduction). Although women in both groups gained some weight, those in the cognitive-behavior therapy group gained more weight (6.6 pounds versus 3.0 pounds respectively). Finally, clients who received the cognitive-behavior therapy also had lower rates of depression, higher rates of self-esteem, and greater satisfaction with their therapy than those in the supportive-expressive therapy.

Family-Based Therapy

Because family interaction patterns are thought to influence the development of disordered eating, many therapists recommend some combination of individual and family therapy in treating eating disorders (Becker et al., 1999; Chen et al., 2016; Goldstein et al., 2016; Murray et al., 2015). People with eating disorders need help changing their social environment in order to fully recover from their unhealthy patterns, and having support and empathy from family members is particularly useful (Garner, Garfinkel, & Bemis, 1982).
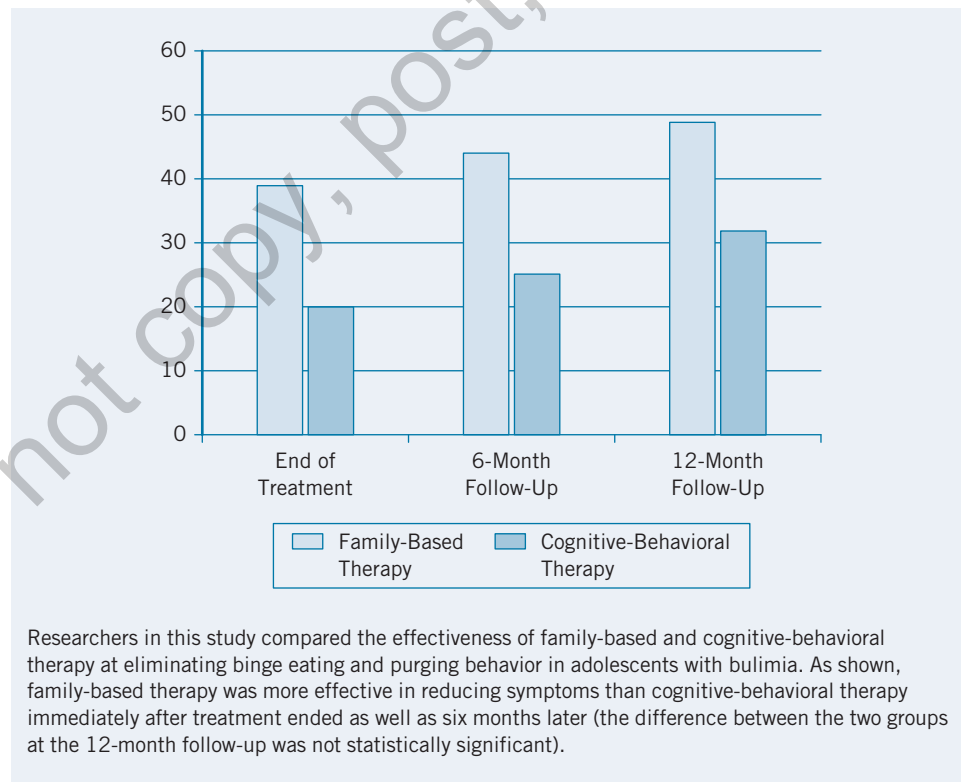
Family therapy is therefore generally more effective than other forms of therapy in treating adolescents with eating disorders. For example, researchers in one study compared family-based

treatment for adolescents with bulimia to supportive psychotherapy (le Grange, Crosby, Rathouz, & Leventhal, 2007). Family-based therapy focuses on giving parents power to stop unhealthy binging and purging behavior, to see the disorder as separate from their child, and to address how bulimia affects their child's development. Supportive psychotherapy, in contrast, focuses on helping adolescents resolve underlying problems that may contribute to the eating disorder and to think about how these problems affect them and what they can do about them in the future. Participants in each condition received 20 therapy sessions over six months of treatment. At the end of treatment, 39% of those in family therapy had stopped engaging in disordered eating behaviors, compared to only 18% of those receiving supportive therapy. These effects were generally maintained as long as six months after treatment, with 29% of those receiving family-based therapy showing a reduction in symptoms of bulimia compared to only 10% of those receiving supportive therapy. These findings suggest that family-based therapy may be particularly beneficial for adolescents with bulimia. Similarly, and as shown in Figure 8.4, family-based therapy is more effective at reducing symptoms of disordered eating than cognitive-behavioral therapy for adolescents with bulimia.

Other Therapeutic Approaches

Interpersonal therapy, which focuses on the interpersonal sources of stress that lead to disordered eating, can also be effective (Agras, 1993). This type of therapy can help disordered eaters identify interpersonal problems that cause stress, such as an obsession with perfectionism (in the case of anorexics) and negative self-image (in the case of bulimics).

Figure 8.4   Data From le Grange et al., 2015

Researchers in this study compared the effectiveness of family-based and cognitive-behavioral therapy at eliminating binge eating and purging behavior in adolescents with bulimia. As shown, family-based therapy was more effective in reducing symptoms than cognitive-behavioral therapy immediately after treatment ended as well as six months later (the difference between the two groups at the 12-month follow-up was not statistically significant).

Source: Data from le Grange, Lock, Agras, Bryson, & Jo (2015).

People with eating disorders may also benefit from therapy that focuses on acceptance and managing emotions (Rowsell, MacDonald, & Carter, 2016). Emotion-acceptance behavior therapy (EABT) combines standard behavioral interventions for treating disordered eating with specific strategies to increase emotion awareness, decrease emotion avoidance, and encourage resumption of valued activities and relationships outside the eating disorder (Wildes, Marcus, Cheng, McCabe, & Gaskill, 2014). This approach is associated with significant improvements in weight, disordered eating symptoms, and emotion avoidance that were maintained over the six-month follow-up. Group therapy that focuses on managing the problematic emotions associated with disordered eating behaviors is also effective in reducing the frequency of binge episodes, improvements in mood, and improvements in emotion regulation and self-efficacy, as well as lower weight in obese patients (Compare & Tasca, 2014; Wnuk, Greenberg, & Dolhanty, 2014). Emotion-focused therapy is also associated with greater weight decline in obese patients with binge eating disorder.

Drug Therapy

Recent evidence suggests drug treatment may help in treating disordered eating, including binge eating disorder (Guerdjikova, Mori, Casuto, & McElroy, 2016; McElroy et al., 2016). Medication can also be useful in treating binge eating disorder, but only if used in combination with psychotherapy (Grilo, Reas, & Mitchell, 2016).

Conclusions

As described in this section, a number of different therapeutic approaches, including group therapy, can be effective for treating disorders eating, and such treatment is especially effective when the patient feels connected to the therapist (Accurso et al., 2015; Polnay, James, Hodges, Murray, Munro, & Lawrie, 2014). Outpatient therapy can help reduce symptoms, and may be particularly likely to be successful when such disorders are diagnosed at an earlier stage (Freudenberg et al., 2015; Toulany et al., 2015). In fact, one analysis comparing the effectiveness of different types of treatment (inpatient, outpatient, etc.) for anorexia revealed no difference (Madden, Hay, & Touyz, 2015).

Unfortunately, recovering from eating disorders is often a long process and may involve repeated treatment; patients and their families should not expect instant results. Many anorexics continue to be underweight and may require repeat hospitalizations, and about one third of bulimics who have fully recovered experience a relapse within two years (Olmsted, Kaplan, & Rockert, 1994). However, and encouragingly, about two thirds of women with anorexia or bulimia will eventually recover from their disorder (Eddy et al., 2016).

Table 8.4   Information YOU Can Use
• If you want to lose weight, develop short-term goals for changing what you eat and increasing physical activity—and make sure to monitor your progress and reward yourself for small successes.
• Simple strategies can help people lose weight and maintain that weight loss. If you are trying to lose weight, try cooking meals at home instead of eating out, keeping healthy foods around for snacking, and engaging in regular exercise.

(Continued)

SUMMARY

Understanding Obesity

- Although historically researchers relied on the use of tables that plot normal weight ranges for people of various heights or calculated the percentage of body fat, the most common measure of obesity today is body mass index (BMI). A BMI between 19 and 24 is considered ideal; 25 to 29 is moderately overweight; and people with indexes greater than 30 are considered obese.

- Obesity is associated with substantial consequences, including physical, psychological, and social. People who are obese are at an increased risk of developing many different types of health problems, including cancer and diabetes. In women, obesity is also linked with fertility problems and poor pregnancy outcomes. Most important, people who are overweight have higher rates of mortality and are particularly at risk of dying from cardiovascular disease. Obese people also suffer negative social and psychological consequences.

- Genetic factors clearly play a role in obesity; they are estimated to predict about 40% to 70% of the variation in BMI. Genes may influence how much—and even what—people want to eat. Genes may also influence metabolism, the rate the body uses energy to carry out basic physiological processes, such as respiration, digestion, and blood pressure.

Psychosocial Factors Contributing to Obesity

- One of the earliest hypotheses about why and when people eat is the internal-external hypothesis, which proposes that people often fail to listen to their internal cues for eating (namely, hunger), and instead pay attention to external cues, such as food taste, smell, and variety. According to restraint theory, people are generally motivated to eat as a function of internal physiological signals that cue hunger. However, when people are trying to lose weight—either because they are obese or because they are dieting—they deliberately ignore these internal signals and instead use cognitive rules to limit their caloric intake. This approach can be successful in helping people restrict their eating, but it can also backfire and lead to overeating. Considerable research indicates that people may eat to influence how they feel, that is, for mood regulation. People eat more when they experience negative affect (e.g., bored, angry, sad, stressed), presumably in an attempt to make themselves feel better.

- Situational factors influence not only how much we eat but also what we eat. People eat more when they are with other people than when they are alone, and are particularly likely to eat more when eating with family and friends. Even subtle environmental factors, such as the size of the dish food is served on and the brightness of the room, influence how much we eat. Cultural factors such as the availability and amount of food may also contribute to obesity

Reducing Obesity

- Preventing obesity must begin in childhood because obese children are very likely to become obese adults. A number of different strategies can help prevent obesity in children, including avoiding using food as a reward, limiting television, encouraging physical activity, and helping children get adequate sleep.

- Various strategies can help overweight and obese people lose weight. These include setting short-term goals, creating rewards, monitoring behavior, making small changes, and getting social support. Larger-scale societal changes can also play a role in treating obesity. In extreme cases, drugs and surgical techniques may be used.

Understanding Disordered Eating

- The three most common types of eating disorders are anorexia nervosa, bulimia nervosa, and binge eating disorder. Anorexia nervosa involves a drastic reduction in a person's food intake and an intentional loss of weight (which eventually leads to amenorrhea), an intense focus on achieving and maintaining a very thin body size, and an excessive fear of gaining weight. Bulimia nervosa is characterized by recurrent episodes of binge eating followed by purging. These episodes are typically triggered by some type of negative emotion, such as anxiety, tension, or even tiredness. Binge eating disorder is characterized by repeatedly eating large quantities of food, often very quickly and to the point of discomfort, and feeling out of control during these episodes. All three types of disordered eating are associated with serious medical consequences.

- Biological factors may influence the likelihood of developing an eating disorder. These factors include particular genes, impairments in brain neurochemistry that lead to dysfunctional eating patterns, and/or exposure to particular sex hormones during the fetal period.

Psychosocial Factors Contributing to Disordered Eating

- Virtually all media images of women in the United States show very thin women. Not surprisingly, the presence of such thin women in the media often leads women of normal weight to feel too heavy, and can thus trigger disordered eating behavior.

- Given the prevalence of the thinness norm and its clear association with femininity and attractiveness, women often believe that they must be thin in order to appeal to potential dating partners. Thinness in women is associated not only with greater success in dating but also with general popularity with both men and women.

- Parents influence their children's eating behaviors in a number of ways, such as by placing a strong emphasis on physical appearance. The families of anorexics often set high standards but have problems with engaging in open communication and managing conflict. The families of bulimics tend to show more conflict and hostility as well as less nurturance and support.

- Anorexics often have a distinct personality style—they are rigid, anxious, perfectionistic, and obsessed with order and cleanliness, and may seem like "the perfect child" to others. People with bulimia are often depressed and anxious, struggle with weight issues, and engage in other types of destructive behaviors. Some research suggests that people with binge eating disorder have more general difficulties in controlling impulses.

Reducing Disordered Eating

- Research on the effectiveness of programs to prevent disordered eating has yielded somewhat mixed findings, in part because some evidence suggests such programs may even lead to unintended negative consequences. However, programs focusing on healthy eating, exercise, and body image can help reduce the likelihood of developing eating disorders. Furthermore, programs that help people learn to critique the thin ideal can help prevent disordered eating.

- A number of different approaches may be used for treating eating disorders. Cognitive-behavioral therapy focuses on normalizing patients' eating patterns, expanding their food choices, and changing their thoughts and attitudes about eating, food, and their bodies. Because family interaction patterns are thought to influence the development of disordered eating, many therapists recommend some combination of individual and family therapy in treating eating disorders, and such approaches tend to be more effective. Other therapeutic approaches, such as interpersonal therapy, emotion-acceptance behavior therapy, and drug therapy, may also be effective.