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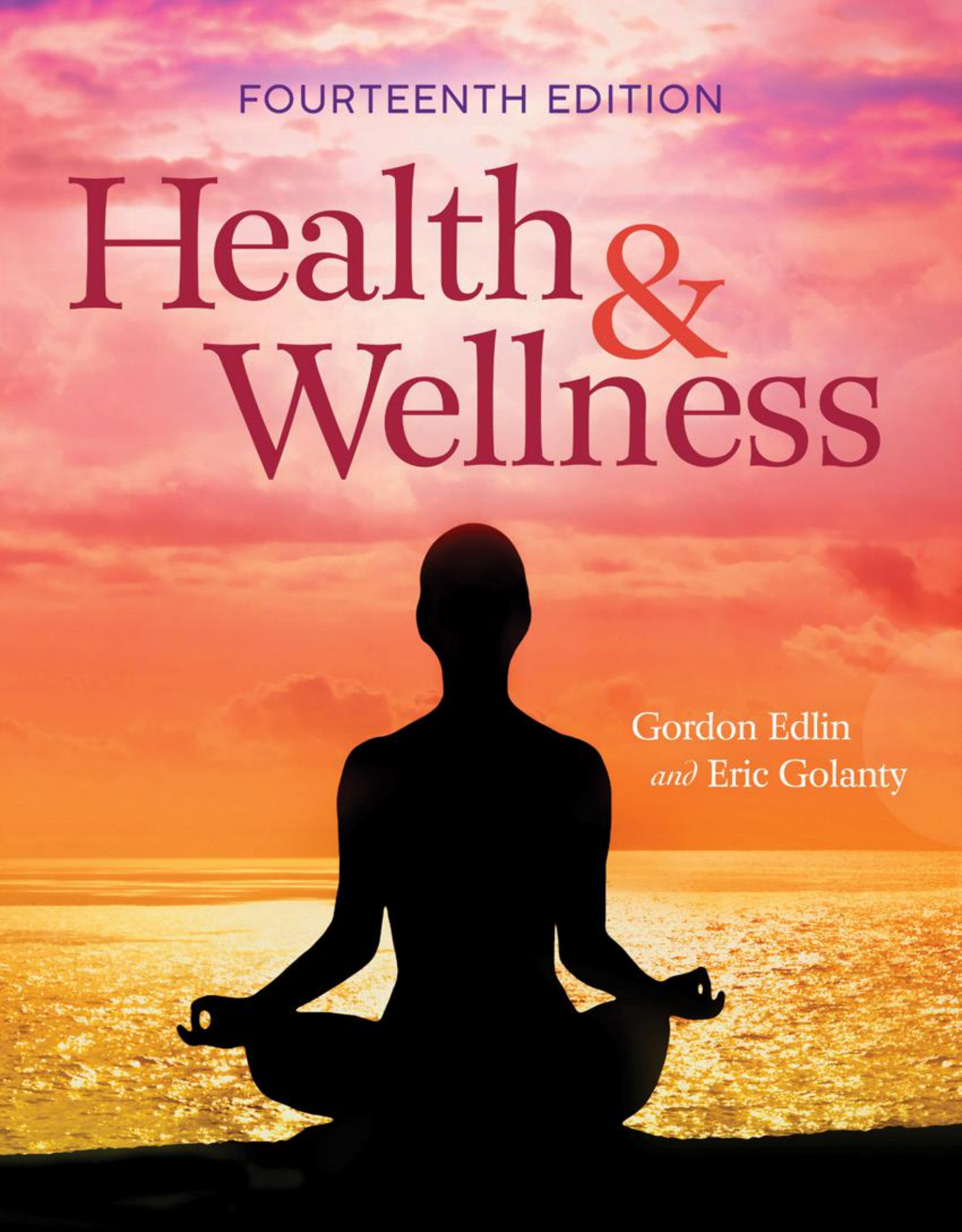
Health & Wellness



Gordon Edlin
and Eric Golanty

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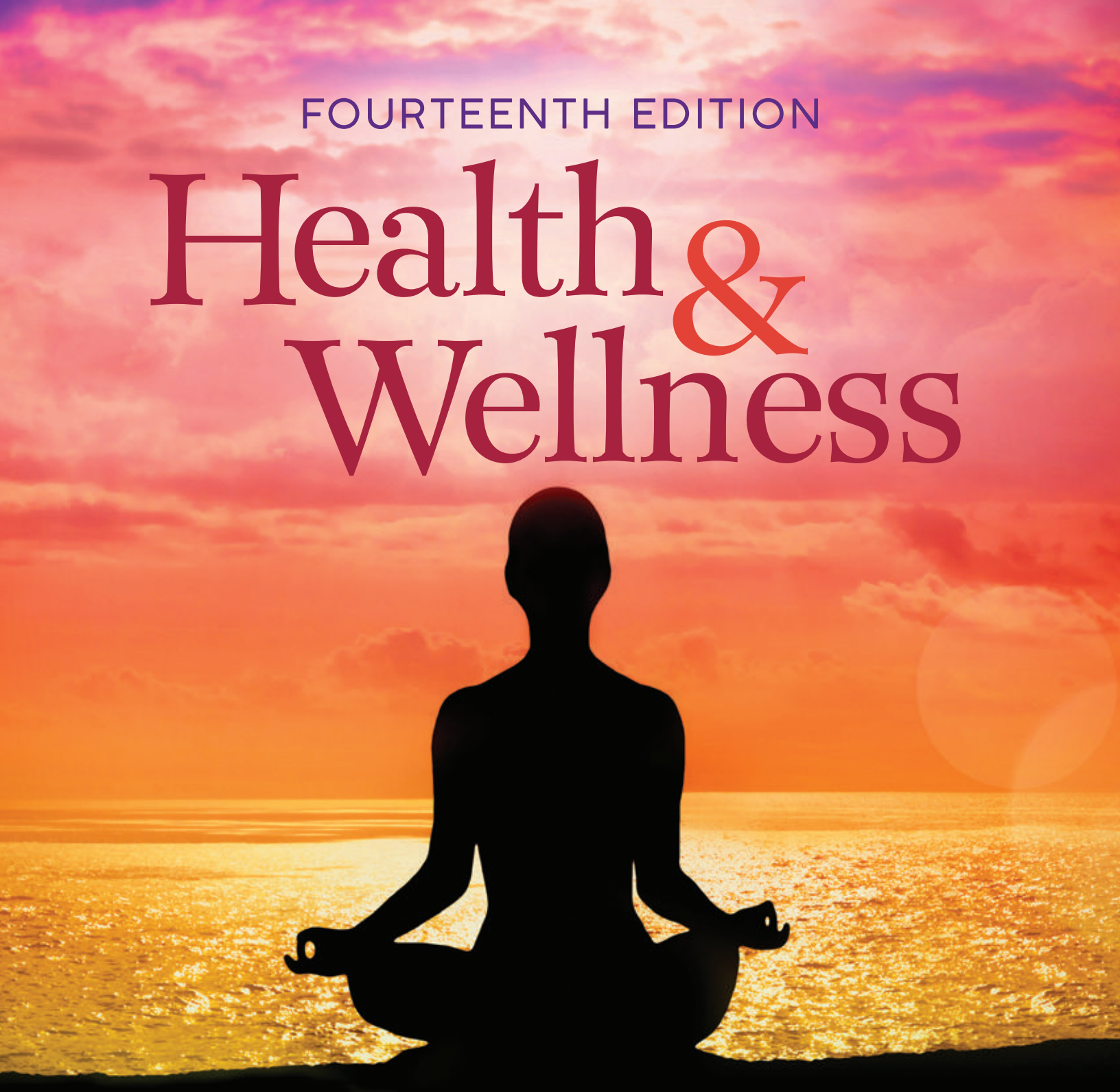

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Preface

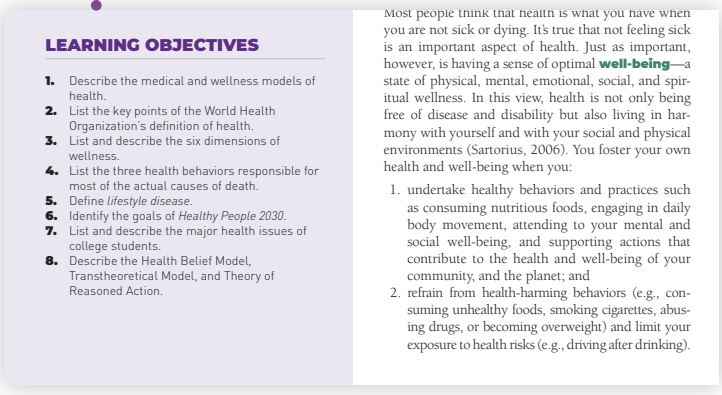
It is with particular pride that we present the fourteenth edition of *Health and Wellness*. Publication of this edition in 2022 represents more than 35 years of continuous use of this textbook by students and instructors in many colleges and universities since the first edition appeared in 1982. A lot has happened to us (the authors), to book publishing, and to the world since then. We are much older, books are available online in digital format, and the world has changed in ways too numerous to mention except one: the existential threat of climate change. However, the visions we (the authors) had of health and how to achieve it are as true today as they were 30 years ago. When we conceived of writing a college-level textbook, rather than focusing on hygiene and disease, as was the custom at the time, instead we chose to present the rationale and scientific evidence for prevention of disease and illness and for individual self-responsibility for fostering a state of well-being and maintaining one's health. Well-being and self-responsibility are now accepted as fundamental in health education. Personal behaviors, lifestyle, mental attitudes, and physical activities are what lead to overall health and wellness.

In recent decades, medical science has made truly remarkable advances in curing or alleviating serious health conditions. At the same time, medical science includes not only better treatment of disease but also acknowledging the importance of patients taking change of their own health and well-being. As the pandemics of heart disease, obesity, diabetes, and infectious diseases represented by COVID-19, malaria, tuberculosis, and HIV, spread around the world, as pollution threatens the livability of the environment, and climate change threatens the health of the entire planet, everyone must understand how their behaviors and attitudes contribute to their personal health or illness and the living things that share Earth with them. The information and guidelines that we set out in previous editions of this book are no less applicable in today's world.

How to Use this Text

We have developed several features to help you learn about health and wellness in this book.

Each chapter of the book begins with a list of **Learning Objectives** to help you focus on the most important concepts in that chapter.



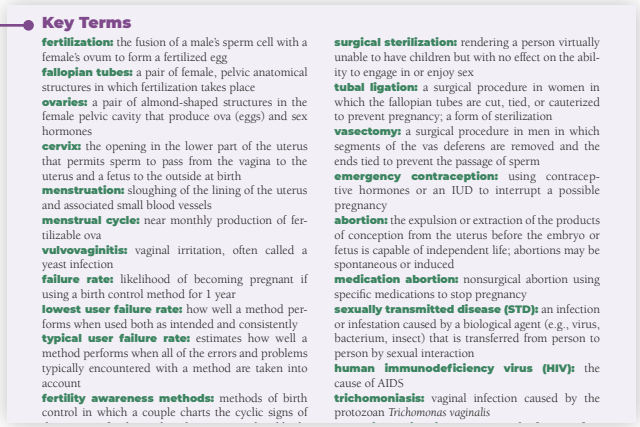
LEARNING OBJECTIVES

1. Describe the medical and wellness models of health.
2. List the key points of the World Health Organization's definition of health.
3. List and describe the six dimensions of wellness.
4. List the three health behaviors responsible for most of the actual causes of death.
5. Define *lifestyle disease*.
6. Identify the goals of *Healthy People 2030*.
7. List and describe the major health issues of college students.
8. Describe the Health Belief Model, Transtheoretical Model, and Theory of Reasoned Action.

Most people think that health is what you have when you are not sick or dying. It's true that not feeling sick is an important aspect of health. Just as important, however, is having a sense of optimal **well-being**—a state of physical, mental, emotional, social, and spiritual wellness. In this view, health is not only being free of disease and disability but also living in harmony with yourself and with your social and physical environments (Sartorius, 2006). You foster your own health and well-being when you:

1. undertake healthy behaviors and practices such as consuming nutritious foods, engaging in daily body movement, attending to your mental and social well-being, and supporting actions that contribute to the health and well-being of your community, and the planet; and
2. refrain from health-harming behaviors (e.g., consuming unhealthy foods, smoking cigarettes, abusing drugs, or becoming overweight) and limit your exposure to health risks (e.g., driving after drinking).

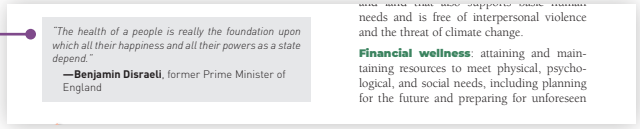
Key Terms are defined at the end of each chapter as well as in the glossary at the end of the book.



Key Terms

fertilization: the fusion of a male's sperm cell with a female's ovum to form a fertilized egg
fallopian tubes: a pair of female, pelvic anatomical structures in which fertilization takes place
ovaries: a pair of almond-shaped structures in the female pelvic cavity that produce ova (eggs) and sex hormones
cervix: the opening in the lower part of the uterus that permits sperm to pass from the vagina to the uterus and a fetus to the outside at birth
menstruation: sloughing of the lining of the uterus and associated small blood vessels
menstrual cycle: near monthly production of fertilizable ova
vulvovaginitis: vaginal irritation, often called a yeast infection
failure rate: likelihood of becoming pregnant if using a birth control method for 1 year
lowest user failure rate: how well a method performs when used both as intended and consistently
typical user failure rate: estimates how well a method performs when all of the errors and problems typically encountered with a method are taken into account
fertility awareness methods: methods of birth control in which a couple charts the cyclic signs of
surgical sterilization: rendering a person virtually unable to have children but with no effect on the ability to engage in or enjoy sex
tubal ligation: a surgical procedure in women in which the fallopian tubes are cut, tied, or cauterized to prevent pregnancy; a form of sterilization
vasectomy: a surgical procedure in men in which segments of the vas deferens are removed and the ends tied to prevent the passage of sperm
emergency contraception: using contraceptive hormones or an IUD to interrupt a possible pregnancy
abortion: the expulsion or extraction of the products of conception from the uterus before the embryo or fetus is capable of independent life; abortions may be spontaneous or induced
medication abortion: nonsurgical abortion using specific medications to stop pregnancy
sexually transmitted disease (STD): an infection or infestation caused by a biological agent (e.g., virus, bacterium, insect) that is transferred from person to person by sexual interaction
human immunodeficiency virus (HIV): the cause of AIDS
trichomoniasis: vaginal infection caused by the protozoan *Trichomonas vaginalis*

Epigrams enliven each chapter with thought-provoking (and often humorous) quotations about health.

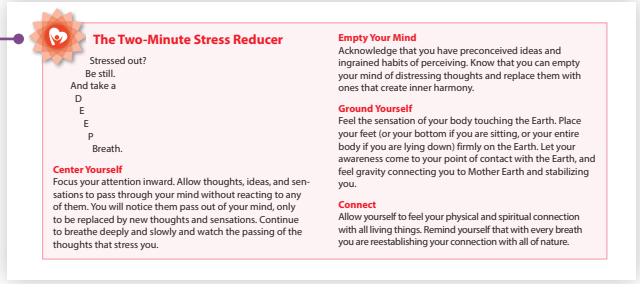


"The health of a people is really the foundation upon which all their happiness and all their powers as a state depend."
—Benjamin Disraeli, former Prime Minister of England

needs and is free of interpersonal violence and the threat of climate change.

Financial wellness: attaining and maintaining resources to meet physical, psychological, and social needs, including planning for the future and preparing for unforeseen

Health Tips in every chapter enable students to make immediate changes to their behavior.



The Two-Minute Stress Reducer

Stressed out?
Be still.
And take a
D
E
E
P
Breath.

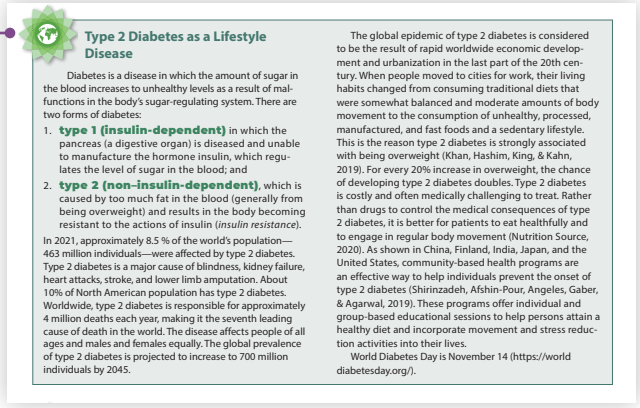
Center Yourself
Focus your attention inward. Allow thoughts, ideas, and sensations to pass through your mind without reacting to any of them. You will notice them pass out of your mind, only to be replaced by new thoughts and sensations. Continue to breathe deeply and slowly and watch the passing of the thoughts that stress you.

Empty Your Mind
Acknowledge that you have preconceived ideas and ingrained habits of perceiving. Know that you can empty your mind of distressing thoughts and replace them with ones that create inner harmony.

Ground Yourself
Feel the sensation of your body touching the Earth. Place your feet (or your bottom if you are sitting, or your entire body if you are lying down) firmly on the Earth. Let your awareness come to your point of contact with the Earth, and feel gravity connecting you to Mother Earth and stabilizing you.

Connect
Allow yourself to feel your physical and spiritual connection with all living things. Remind yourself that with every breath you are reestablishing your connection with all of nature.

Current topics are highlighted in boxes to give a complete perspective in your study of health and wellness. **Global Wellness** boxes explore health and wellness topics as they affect different countries and cultures.



Type 2 Diabetes as a Lifestyle Disease

Diabetes is a disease in which the amount of sugar in the blood increases to unhealthy levels as a result of malfunctions in the body's sugar-regulating system. There are two forms of diabetes:

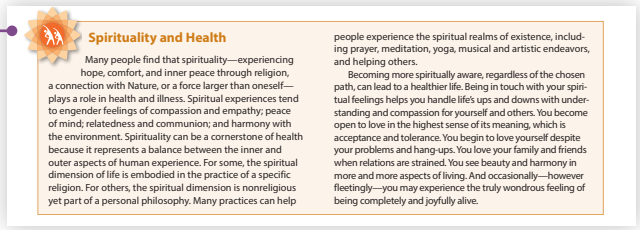
1. **type 1 (insulin-dependent)** in which the pancreas (a digestive organ) is diseased and unable to manufacture the hormone insulin, which regulates the level of sugar in the blood; and
2. **type 2 (non-insulin-dependent)**, which is caused by too much fat in the blood (generally from being overweight) and results in the body becoming resistant to the actions of insulin (*insulin resistance*).

In 2021, approximately 8.5 % of the world's population—463 million individuals—were affected by type 2 diabetes. Type 2 diabetes is a major cause of blindness, kidney failure, heart attacks, stroke, and lower limb amputation. About 10% of North American population has type 2 diabetes. Worldwide, type 2 diabetes is responsible for approximately 4 million deaths each year, making it the seventh leading cause of death in the world. The disease affects people of all ages and males and females equally. The global prevalence of type 2 diabetes is projected to increase to 700 million individuals by 2045.

The global epidemic of type 2 diabetes is considered to be the result of rapid worldwide economic development and urbanization in the last part of the 20th century. When people moved to cities for work, their living habits changed from consuming traditional diets that were somewhat balanced and moderate amounts of body movement to the consumption of unhealthy, processed, manufactured, and fast foods and a sedentary lifestyle. This is the reason type 2 diabetes is strongly associated with being overweight (Khan, Hashim, King, & Kahn, 2019). For every 20% increase in overweight, the chance of developing type 2 diabetes doubles. Type 2 diabetes is costly and often medically challenging to treat. Rather than drugs to control the medical consequences of type 2 diabetes, it is better for patients to eat healthfully and to engage in regular body movement (Nutrition Source, 2020). As shown in China, Finland, India, Japan, and the United States, community-based health programs are an effective way to help individuals prevent the onset of type 2 diabetes (Shirinzadeh, Afshin-Pour, Angeles, Gaber, & Agarwal, 2019). These programs offer individual and group-based educational sessions to help persons attain a healthy diet and incorporate movement and stress reduction activities into their lives.

World Diabetes Day is November 14 (https://worldiabetesday.org/).

Wellness Guides offer tips, techniques, and steps toward a healthy lifestyle and self-responsibility.



Spirituality and Health

Many people find that spirituality—experiencing hope, comfort, and inner peace through religion, a connection with Nature, or a force larger than oneself—plays a role in health and illness. Spiritual experiences tend to engender feelings of compassion and empathy; peace of mind; relatedness and communion; and harmony with the environment. Spirituality can be a cornerstone of health because it represents a balance between the inner and outer aspects of human experience. For some, the spiritual dimension of life is embodied in the practice of a specific religion. For others, the spiritual dimension is nonreligious yet part of a personal philosophy. Many practices can help people experience the spiritual realms of existence, including prayer, meditation, yoga, musical and artistic endeavors, and helping others.

Becoming more spiritually aware, regardless of the chosen path, can lead to a healthier life. Being in touch with your spiritual feelings helps you handle life's ups and downs with understanding and compassion for yourself and others. You become open to love in the highest sense of its meaning, which is acceptance and tolerance. You begin to love yourself despite your problems and hang-ups. You love your family and friends when relations are strained. You see beauty and harmony in more and more aspects of living. And occasionally—however fleetingly—you may experience the truly wondrous feeling of being completely and joyfully alive.

Managing Stress boxes give you practical strategies for coping with stress.

Mind–Body Harmony

When you are well and healthy, your body systems function harmoniously. If one of your organs is not functioning properly, however, the other organs may not be able to function correctly either, and you may become ill. Thus, disease may be regarded as the disruption of a whole person's physical and mental harmony.

In traditional Western science and medicine, mind–body harmony is considered in terms of *homeostasis*, the tendency for coordinated self-regulation among bodily processes that leads to optimal functioning and survival. Many Asian philosophies embody an idea of mind–body harmony. This idea is based on a universal energy called **chi** (or *qi*), which must be distributed harmoniously throughout the mind–body to attain and maintain health. Harmony is expressed as a balance of forces called *yin* and *yang*. Yin and yang represent the opposing and complementary aspects of the universal chi that is present in everything, including our bodies. Yang forces are characterized as light, positive, creative, full of movement, and having the nature of heaven. Yin forces are characterized as dark, negative, quiet, receptive, and having the nature of Earth.

The Yin–Yang Symbol
This symbol represents the harmonious balance of forces in Nature and in people. The white and dark dots show that there is always some yin in a person's yang component and vice versa. The goal in life and Nature, according to the traditional Asian view, is to maintain a harmonious balance between yin and yang forces.

In Asian philosophies and medicine, body and mind are regarded as inseparable. Yin and yang apply to both mental and physical processes. When yin and yang forces are in balance in an individual, a state of harmony exists and the person experiences health and wellness. However, if either yin or yang forces come to predominate in a person, a state of disharmony is produced and disease may result.

Treatment of disease is designed to reestablish harmony of the mind and body. The balance of yin and yang forces must be restored so that health returns.

T'ai chi ch'uan and *qigong* (pronounced jē-kung) are Chinese mind–body methods that are practiced by many North Americans to help maintain health and harmony. These exercises are especially useful for older persons whose bodies can no longer manage vigorous exercise. People who practice *qigong* experience lower blood pressure, improved circulation, and enhanced immune system functions.

Dollars & Health Sense boxes focus on the influence of economic forces on individual and community health; for example, the marketing of worthless and sometimes dangerous supplements and devices for weight management, fitness, and stress relief; direct-to-consumer advertising in the marketing of minimally effective and sometimes dangerous pharmaceuticals; and cigarette advertising to encourage youths to start smoking.

Profiting from Making People Sick

Heart disease, stroke, lung cancer, colon cancer, type 2 diabetes, and chronic obstructive pulmonary disease account for nearly half of all deaths in the United States. These diseases are caused in large part by unhealthy lifestyle choices: eating poorly, smoking cigarettes, being overweight, and not exercising. Unfortunately, many businesses profit from individuals' unhealthy lifestyles—indeed, some encourage unhealthy behavior as the basis of their business (Allen, 2019).

The tobacco industry is the prime example of profiting financially from harming others. No other industry makes a product that, when used as directed, causes disease and death. Knowing that long-term smokers (i.e., their best customers) tend to begin smoking as teens, the tobacco industry uses sophisticated marketing methods to lure young people to smoke and to get them hooked. The tobacco industry is a friend to no one.

Whereas it is not as obvious as with tobacco, some food companies also profit from harming their customers. A typical serving of fast food (e.g., burger, fries, and a soft drink or shake) contains around 1,000 calories, about half or more of most individuals' energy requirement for one day. This is why a steady diet of fast food can lead to weight problems and associated illnesses like type 2 diabetes.

Some of America's largest corporations are in the business of supplying consumers with less-than-healthy amounts of sugar (**Figure 1.1A**). The sugar is contained in packaged foods (from ketchup to breakfast cereals), snack foods, fast foods, and sugar-sweetened beverages such as sodas, energy drinks, and sports drinks. Sugar-sweetened beverages alone deliver 36% of the added sugar that Americans consume, contributing to the risk of heart

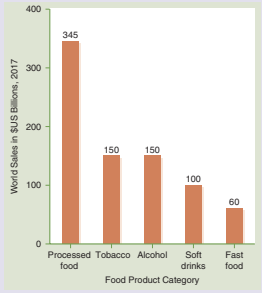


Figure 1.1A Sales Figures for 33 Leading Transnational Corporations in 2017 by Sector.

Chapters conclude with **Critical Thinking About Health**—a set of questions that present controversial or thought-provoking situations and ask you to examine your opinions and explore your biases.

Critical Thinking About Health

1. Identify one time in your life when you have been seriously ill (not counting colds or minor injuries). Describe the nature of the illness and the time it took to become well again. Discuss all of the factors that you think may have contributed to your becoming sick, including stress, emotional problems, poor nutrition, and so forth. Then discuss all of the factors that you believe contributed to your becoming well again, including medical care, prayer, family support, alternative medicines, and other factors. What were the most important factors that led to your becoming sick? What were the most important ones in the healing process?
2. In your opinion, what is the role of religion or spirituality in health? To what degree should religion or spirituality be part of a clinical encounter between a patient and a health practitioner?
3. Describe any experiences you have had with meditation, hypnosis, yoga, qigong, image visualization, or any other form of mental focusing and relaxation. Describe how you became involved with this activity and for what purpose you used it. Did it help you solve a particular health or emotional problem? Would you recommend this technique to others?

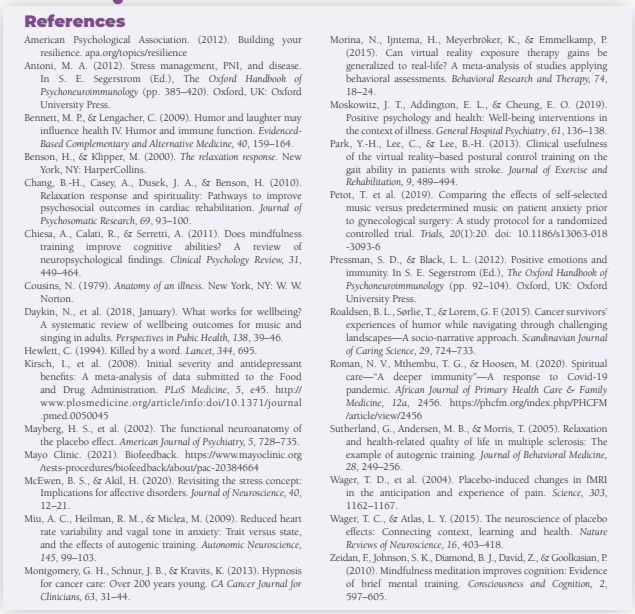
can cause bodily organs to malfunction, thus leading to illness. A dramatic example of the mind's power to affect health is the placebo effect. If a person believes in the power of a pill to cure or prevent disease, taking such a placebo pill will often work as well as a prescribed drug. Belief can heal because the mind has the power to change body chemistry.

Just as the body can be trained to do certain things, the mind also can be trained to calm anxieties and to facilitate healing. Techniques such as meditation, hypnosis, image visualization, and many others increase awareness of thoughts, reduce stress and emotional upset, and even alter body chemistry to promote healing and health. Learning and practicing meditation regularly or another of several mental relaxation techniques can provide lifelong tools for improving health and coping with upsetting situations that one encounters in life.

Highlights

- The human mind can cause changes in body chemistry through thoughts and feelings, which may have a positive or negative effect on your health.
- Optimal health is achieved when the mind and body communicate harmoniously.
- Disease can be regarded as disruption of homeostasis or disruption of the harmonious interaction of mind and body.
- The mind and organs of the body communicate

End-of-chapter material includes a **Chapter Summary** and **Highlights** (a brief review of the chapter), **References**, **Suggested Readings**, and **Recommended Websites** where you can find additional health information.



References

American Psychological Association. (2012). Building your resilience. apa.org/topics/resilience

Antoni, M. A. (2012). Stress management, PNI, and disease. In S. E. Segerstrom (Ed.), The *Oxford Handbook of Psychoneuroimmunology* (pp. 385–420). Oxford, UK: Oxford University Press.

Bennett, M. P., & Lengacher, C. (2009). Humor and laughter may influence health IV. Humor and immune function. *Evidenced-Based Complementary and Alternative Medicine, 40*, 159–164.

Benson, H., & Klipper, M. (2000). *The relaxation response*. New York, NY: HarperCollins.

Chang, B.-H., Casey, A., Dusek, J. A., & Benson, H. (2010). Relaxation response and spirituality: Pathways to improve psychosocial outcomes in cardiac rehabilitation. *Journal of Psychosomatic Research, 69*, 93–100.

Chiesa, A., Calati, R., & Serretti, A. (2011). Does mindfulness training improve cognitive abilities? A review of neuropsychological findings. *Clinical Psychology Review, 31*, 449–464.

Cousins, N. (1979). *Anatomy of an illness*. New York, NY: W. W. Norton.

Daykin, N., et al. (2018, January). What works for wellbeing? A systematic review of wellbeing outcomes for music and singing in adults. *Perspectives in Pubic Health, 138*, 39–46.

Hewlett, C. (1994). Killed by a word. *Lancet, 344*, 695.

Kirsch, I., et al. (2008). Initial severity and antidepressant benefits: A meta-analysis of data submitted to the Food and Drug Administration. *PLoS Medicine, 5*, e45. http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.0050045

Mayberg, H. S., et al. (2002). The functional neuroanatomy of the placebo effect. *American Journal of Psychiatry, 5*, 728–735.

Mayo Clinic. (2021). Biofeedback. https://www.mayoclinic.org/tests-procedures/biofeedback/about/pac-20384664

McEwen, B. S., & Akil, H. (2020). Revisiting the stress concept: Implications for affective disorders. *Journal of Neuroscience, 40*, 12–21.

Miu, A. C., Heilman, R. M., & Miclea, M. (2009). Reduced heart rate variability and vagal tone in anxiety: Trait versus state, and the effects of autogenic training. *Autonomic Neuroscience, 145*, 99–103.

Montgomery, G. H., Schnur, J. B., & Kravits, K. (2013). Hypnosis for cancer care: Over 200 years young. *CA Cancer Journal for Clinicians, 63*, 31–44.

Morina, N., Ijntema, H., Meyerbröker, K., & Emmelkamp, P. (2015). Can virtual reality exposure therapy gains be generalized to real-life? A meta-analysis of studies applying behavioral assessments. *Behavioral Research and Therapy, 74*, 18–24.

Moskowitz, J. T., Addington, E. L., & Cheung, E. O. (2019). Positive psychology and health: Well-being interventions in the context of illness. *General Hospital Psychiatry, 61*, 136–138.

Park, Y.-H., Lee, C., & Lee, B.-H. (2013). Clinical usefulness of the virtual reality–based postural control training on the gait ability in patients with stroke. *Journal of Exercise and Rehabilitation, 9*, 489–494.

Petot, T. et al. (2019). Comparing the effects of self-selected music versus predetermined music on patient anxiety prior to gynecological surgery: A study protocol for a randomized controlled trial. *Trials, 20*(1):20. doi: 10.1186/s13063-018-3093-6

Pressman, S. D., & Black, L. L. (2012). Positive emotions and immunity. In S. E. Segerstrom (Ed.), *The Oxford Handbook of Psychoneuroimmunology* (pp. 92–104). Oxford, UK: Oxford University Press.

Roaldsen, B. L., Sørlie, T., & Lorem, G. F. (2015). Cancer survivors' experiences of humor while navigating through challenging landscapes—A socio-narrative approach. *Scandinavian Journal of Caring Science, 29*, 724–733.

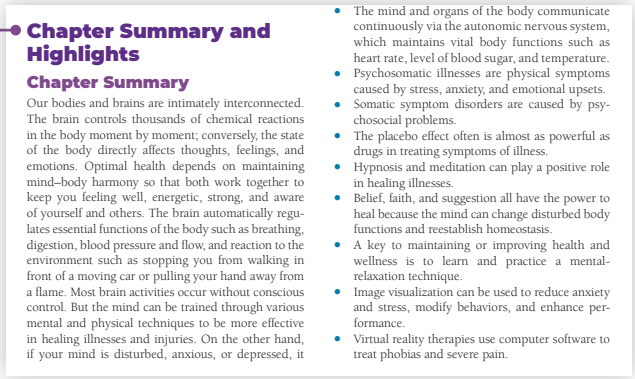
Roman, N. V., Mthembu, T. G., & Hoosen, M. (2020). Spiritual care—"A deeper immunity"—A response to Covid-19 pandemic. *African Journal of Primary Health Care & Family Medicine, 12a*, 2456. https://phcfm.org/index.php/PHCFM/article/view/2456

Sutherland, G., Andersen, M. B., & Morris, T. (2005). Relaxation and health-related quality of life in multiple sclerosis: The example of autogenic training. *Journal of Behavioral Medicine, 28*, 249–256.

Wager, T. D., et al. (2004). Placebo-induced changes in fMRI in the anticipation and experience of pain. *Science, 303*, 1162–1167.

Wager, T. C., & Atlas, L. Y. (2015). The neuroscience of placebo effects: Connecting context, learning and health. *Nature Reviews of Neuroscience, 16*, 403–418.

Zeidan, F., Johnson, S. K., Diamond, B. J., David, Z., & Goolkasian, P. (2010). Mindfulness meditation improves cognition: Evidence of brief mental training. *Consciousness and Cognition, 2*, 597–605.



Chapter Summary and Highlights

Chapter Summary

Our bodies and brains are intimately interconnected. The brain controls thousands of chemical reactions in the body moment by moment; conversely, the state of the body directly affects thoughts, feelings, and emotions. Optimal health depends on maintaining mind–body harmony so that both work together to keep you feeling well, energetic, strong, and aware of yourself and others. The brain automatically regulates essential functions of the body such as breathing, digestion, blood pressure and flow, and reaction to the environment such as stopping you from walking in front of a moving car or pulling your hand away from a flame. Most brain activities occur without conscious control. But the mind can be trained through various mental and physical techniques to be more effective in healing illnesses and injuries. On the other hand, if your mind is disturbed, anxious, or depressed, it

- The mind and organs of the body communicate continuously via the autonomic nervous system, which maintains vital body functions such as heart rate, level of blood sugar, and temperature.
- Psychosomatic illnesses are physical symptoms caused by stress, anxiety, and emotional upsets.
- Somatic symptom disorders are caused by psychosocial problems.
- The placebo effect often is almost as powerful as drugs in treating symptoms of illness.
- Hypnosis and meditation can play a positive role in healing illnesses.
- Belief, faith, and suggestion all have the power to heal because the mind can change disturbed body functions and reestablish homeostasis.
- A key to maintaining or improving health and wellness is to learn and practice a mental-relaxation technique.
- Image visualization can be used to reduce anxiety and stress, modify behaviors, and enhance performance.
- Virtual reality therapies use computer software to treat phobias and severe pain.

What's New

This edition of *Health and Wellness* has been thoughtfully revised to be more efficient at presenting current health topics (e.g., COVID 19, opioid epidemic, climate change) while maintaining complete presentations of topics in prior editions. Some former chapters were carefully edited and combined: 8–11 were combined to create a new Chapter 8; 17–18 were combined to create a new Chapter 14; 19–20 were combined to create a new Chapter 15; and 21–23 were combined to create a new Chapter 17. Some material (e.g., birth control methods) was linked to authoritative health resources on the Internet (e.g., MedlinePlus). The **Workbook** was moved to the course website.

Reviewers

We would like to thank the following reviewers for their insightful analysis and response to this text:

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A Note of Thanks

Throughout all of the editions of *Health and Wellness*, many people have contributed support and guidance. This book has benefited greatly from their comments, opinions, thoughtful critiques, expert knowledge, and constructive suggestions. We are most appreciative for their participation in this project. We would especially like to thank Brian Luke Seaward, PhD, Paramount Wellness Institute; James Walsh; Esther M. Weekes; Martin Schulz; Shae Bearden; Rocky Young; Bharti Temkin; and Laura Jones-Swann, MEd, LCDC, Texas Tech.

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This new edition could not have been published without the efforts of the staff at Jones & Bartlett Learning and the Health Science team: Whitney Fekete, Ashley Malone, Angela Montoya, Benjamin Roy, Troy Liston, and Andrea DeFronzo. To all, we express our appreciation.

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CHAPTER 1

The Definition of Health

Health Tips
- The Two-Minute Stress Reducer

Dollars & Health Sense
- Profiting from Making People Sick
- How Much Money Is a Life Worth?

Global Wellness
- Social Factors and Health: The COVID-19 Pandemic
- Type 2 Diabetes as a Lifestyle Disease

Managing Stress
- Mind–Body Harmony

Wellness Guide
- Spirituality and Health

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1. undertake healthy behaviors and practices such as consuming nutritious foods, engaging in daily body movement, attending to your mental and social well-being, and supporting actions that contribute to the health and well-being of your community, and the planet; and
2. refrain from health-harming behaviors (e.g., consuming unhealthy foods, smoking cigarettes, abusing drugs, or becoming overweight) and limit your exposure to health risks (e.g., driving after drinking).

The World Health Organization (WHO) defines health as "a state of complete physical, mental, and social well-being and not merely the absence of disease and infirmity." This definition reflects the old English root of our word health, which is *hal*, meaning well or whole. The WHO definition recognizes that health is affected by the interrelatedness of the physical, psychological, emotional, spiritual, and environmental influences in people's lives. There is more to health than freedom from sickness. Being healthy also means being able to do what you want to, what you must do at the appropriate time, and being in good spirits and feeling emotionally healthy most of the time.

Jesse Williams (1939), one of the founders of modern health education, echoes the WHO definition by describing health as "that condition of the individual that makes possible the highest enjoyment of life, the greatest constructive work, and that shows itself in the best service to the world. . . . Health as freedom from disease is a standard of mediocrity; health as a quality of life is a standard of inspiration and increasing achievement."

In this chapter, we discuss the definition of health, how modern lifestyles contribute to an enormous degree of chronic illness throughout the world, and how adopting healthy living habits can help people maintain wellness. Throughout this text, we show you ways to maximize your health by understanding how your mind and body function, how to limit exposure to pollution and toxic substances, how to make informed decisions about health and health care, how to be responsible for your actions and behaviors, and how social, economic, and political forces affect your ability to lead a healthy life. Learning to be responsible for the degree of health and vitality you want while you are young will help ensure lifelong wellness and the capacity to cope with sickness when it does occur.

Models of Health

Scientists and health educators have developed two main ways to define health: the medical model and the wellness model.

The Medical Model of Health

The **medical model** of health's main tenet is that health is the absence of one or more of the "five D's"—death, disease, discomfort, disability, and

Mind–Body Harmony

When you are well and healthy, your body systems function harmoniously. If one of your organs is not functioning properly, however, the other organs may not be able to function correctly either, and you may become ill. Thus, disease may be regarded as the disruption of a whole person's physical and mental harmony.

In traditional Western science and medicine, mind–body harmony is considered in terms of *homeostasis*, the tendency for coordinated self-regulation among bodily processes that leads to optimal functioning and survival. Many Asian philosophies embody an idea of mind–body harmony. This idea is based on a universal energy called **chi** (or *qi*), which must be distributed harmoniously throughout the mind–body to attain and maintain health. Harmony is expressed as a balance of forces called *yin* and *yang*. Yin and yang represent the opposing and complementary aspects of the universal chi that is present in everything, including our bodies. Yang forces are characterized as light, positive, creative, full of movement, and having the nature of heaven. Yin forces are characterized as dark, negative, quiet, receptive, and having the nature of Earth.

The Yin–Yang Symbol
This symbol represents the harmonious balance of forces in Nature and in people. The white and dark dots show that there is always some yin in a person's yang component and vice versa. The goal in life and Nature, according to the traditional Asian view, is to maintain a harmonious balance between yin and yang forces.

In Asian philosophies and medicine, body and mind are regarded as inseparable. Yin and yang apply to both mental and physical processes. When yin and yang forces are in balance in an individual, a state of harmony exists and the person experiences health and wellness. However, if either yin or yang forces come to predominate in a person, a state of disharmony is produced and disease may result.

Treatment of disease is designed to reestablish harmony of the mind and body. The balance of yin and yang forces must be restored so that health returns.

T'ai chi ch'uan and *qigong* (pronounced jê-kung) are Chinese mind–body methods that are practiced by many North Americans to help maintain health and harmony. These exercises are especially useful for older persons whose bodies can no longer manage vigorous exercise. People who practice *qigong* experience lower blood pressure, improved circulation, and enhanced immune system functions.

dissatisfaction. In other words, if you are not sick, disabled, or mentally unstable or otherwise miserable, you are defined as healthy. The medical model relies almost exclusively on biological explanations of disease and illness and is interpreted in terms of malfunctioning organs, cells, and other biological systems (e.g., liver disease, heart disease, or osteoporosis). In the medical model, the absence of health is determined by the presence of observable or measurable symptoms. In times of sickness, the restoration of health is determined by the successful alleviation of symptoms and hopefully ridding the body of the underlying cause of the disease.

The Wellness Model of Health

The **wellness model** emphasizes self-healing, the promotion of health, and the prevention of illness rather than solely treating symptoms of disease. Besides the absence of disease, the wellness model of health encompasses the following dimensions:

Physical wellness: maintaining a healthy body and mind (brain) by consuming nutritious food, attaining near daily manageable amounts of bodily movement, undertaking informed and responsible health practices both to enhance well-being and prevent illness, and seeking competent medical care when ill.

Emotional wellness: understanding, managing, and mindfully expressing your emotions and coping healthfully with life's problems and stresses. Emotional wellness involves taking responsibility for your behavior, cultivating wisdom, and maintaining a sense of humor.

Intellectual wellness: having a mind open to new ideas and concepts and to access and critically evaluate the veracity of health information. Much of the content of mass media—social media, the Internet, television, and print outlets—refers to health issues. Health practitioners and researchers are trained to assess critically the findings, interpretations, and conclusions drawn from health research, and in the best cases nonprofessionals can receive unbiased explanations of research from professionals they trust and whose goals are to enhance others' health and well-being. However, because its primary goal is profit and not necessarily accurate and unbiased reporting, mass media may skew presentations about health research to capture interest (and to sell products and services) rather than to enlighten and educate (**Figure 1.1**).

Assessing Health and Medical Information

Things to keep in mind when getting information derived from health and medical research:

- What organization or individual is providing the information? What is the provider's stated or implied intention? Assessing the motives of information provided on the internet is especially important because a web site can be made to appear educational when, in fact, its goal is to influence attitudes and behaviors, including purchases.
- What is the information provider's training and expertise? Popular magazine articles often quote scientists and doctors to support the article's thesis. Can you really be sure that the person being quoted is a reliable authority?* What is the source of the data in the research? Is the information based on an observer's experience, a survey, or a study comparing a "treatment" group with a group of "matched controls."
- Who Benefits? What benefits is the source of the information receiving for communicating it. You want to avoid being manipulated by bias presented in the guise of scientific truth.

Occasionally, a study's results are described as *statistically significant*, which means that an observation, or a comparison of observations, is highly likely not to be the result of mistakes made by researchers or to have occurred by chance. Findings are statistically significant if a mathematical analysis of the data show a very small — or *insignificant* — chance that the findings from this analysis are wrong. Scientists generally are willing to accept a finding as true if the chance it is wrong is less than 1 in 20 (reported as p = 0.05).

Figure 1.1 Certain Things Should be Kept in Mind When Getting Information Derived from Health and Medical Research.

Social wellness: striving for healthy and harmonious interactions with others including family, friends, intimate-partners, classmates, neighbors, and the larger local and world communities. Social wellness involves effectively communicating thoughts and ideas to others and receiving with acceptance and tolerance the thoughts, ideas, and emotional expressions of others, including those who are different from yourself. Social

Spirituality and Health

Many people find that spirituality—experiencing hope, comfort, and inner peace through religion, a connection with Nature, or a force larger than oneself—plays a role in health and illness. Spiritual experiences tend to engender feelings of compassion and empathy; peace of mind; relatedness and communion; and harmony with the environment. Spirituality can be a cornerstone of health because it represents a balance between the inner and outer aspects of human experience. For some, the spiritual dimension of life is embodied in the practice of a specific religion. For others, the spiritual dimension is nonreligious yet part of a personal philosophy. Many practices can help people experience the spiritual realms of existence, including prayer, meditation, yoga, musical and artistic endeavors, and helping others.

Becoming more spiritually aware, regardless of the chosen path, can lead to a healthier life. Being in touch with your spiritual feelings helps you handle life's ups and downs with understanding and compassion for yourself and others. You become open to love in the highest sense of its meaning, which is acceptance and tolerance. You begin to love yourself despite your problems and hang-ups. You love your family and friends when relations are strained. You see beauty and harmony in more and more aspects of living. And occasionally—however fleetingly—you may experience the truly wondrous feeling of being completely and joyfully alive.

wellness also includes managing your time and activities effectively.

Spiritual wellness: a state of harmony within yourself, with other people, and with a deity or Nature. Most often spiritual wellness involves a sense of identifying with a beneficent group, philosophy, or a religious practice that is larger than yourself. Spiritual wellness also includes positive and helpful personal values and beliefs, seeking meaning and purpose in life, practicing compassion, and appreciating natural forces in the universe.

"The health of a people is really the foundation upon which all their happiness and all their powers as a state depend."

—Benjamin Disraeli, former Prime Minister of England

Occupational wellness: finding satisfaction, creativity, and a sense of accomplishment in what you do to earn a living, to contribute through your work to making a healthy society and world and creating a balance among work activities and other aspects of life.

Environmental wellness: living in an environment characterized by clean air, water, and land that also supports basic human needs and is free of interpersonal violence and the threat of climate change.

Financial wellness: attaining and maintaining resources to meet physical, psychological, and social needs, including planning for the future and preparing for unforeseen financial difficulties ("Hope for the best, plan for the worst."), and being aware of others' financial values, needs and circumstances.

The Two-Minute Stress Reducer

Stressed out?
Be still.
And take a
D
E
E
P
Breath.

Center Yourself
Focus your attention inward. Allow thoughts, ideas, and sensations to pass through your mind without reacting to any of them. You will notice them pass out of your mind, only to be replaced by new thoughts and sensations. Continue to breathe deeply and slowly and watch the passing of the thoughts that stress you.

Empty Your Mind
Acknowledge that you have preconceived ideas and ingrained habits of perceiving. Know that you can empty your mind of distressing thoughts and replace them with ones that create inner harmony.

Ground Yourself
Feel the sensation of your body touching the Earth. Place your feet (or your bottom if you are sitting, or your entire body if you are lying down) firmly on the Earth. Let your awareness come to your point of contact with the Earth, and feel gravity connecting you to Mother Earth and stabilizing you.

Connect
Allow yourself to feel your physical and spiritual connection with all living things. Remind yourself that with every breath you are reestablishing your connection with all of nature.

Health is not something suddenly achieved at a specific time like graduating from college. Rather, health is a lifelong process through which you develop and encourage every aspect of your body, mind, and spirit to interrelate harmoniously as much as possible. Almost every choice we make in life can potentially affect our health and well-being. Sometimes the social and physical environments present obstacles to making healthful choices. For example, a person may know not to eat fatty fast food every day, but this kind of food may be easier to obtain than healthier alternatives. Wellness includes recognizing that some social influences are not healthy and finding healthier alternatives. It also includes taking actions to make the social and physical environments healthier for all.

Determinants of Health and Wellness

Determinants of health and wellness consist of personal, social, economic, and environmental factors that affect individual, community, and world health. The main determinants of health include the following: personal biology, economic and social status, environmental attainment, environmental quality, and individual behaviors.

Personal Biology

Personal biology is a manifestation of one's genetic endowment and life experiences that affect the body throughout the life course. The genetic endowment consists of the many thousands of genes inherited from parents that determine the body's structure and function (see Chapter 12). Malfunctioning genes can cause serious, life-altering inherited diseases such as sickle cell disease, cystic fibrosis, or breast cancer (Genetics, 2020). Long-lasting or permanent change to one's personal biology can result from infections, accidents, or acts of violence that result in impaired mobility, mental processes, hearing, and vision and that significantly alter one's life in other ways (U.S. Centers for Disease Control and Prevention, 2019).

Some 12% of Americans have had *adverse childhood experiences* or ACEs (divorce, abandonment, rejection, parental substance abuse, sexual abuse, and neglect) (**Table 1.1**). Four or more ACEs are associated with a proportional increased risk for mental and physical ill health throughout life and early death (U.S. Centers for Disease Control and Prevention, 2021). Attempting to cope with the mental health consequences of ACEs, such as anxiety and depression, can lead to unhealthy lifestyle behaviors such as overeating or consuming unhealthy foods, substance abuse, poor sleep, and lack of physical activity (Felitti, 2009). Recovery from the traumas of ACEs is possible with a personal intention to heal, therapist-guided mental and physical exercises, and the support of caring others.

Economic and Social Status

Economic determinants of health include resources to meet life's needs, such as healthy food, an adequate education, a good-paying job, living in clean and safe surroundings, and access to quality medical care. Social determinants also include social support and community cohesion. Social and economic determinants of health are greatly affected by discrimination by race, sex, gender, and social status (see the Global Wellness box "Social Factors and Health: The COVID-19 Pandemic").

Environmental Attainment

Educational attainment has a major effect health and wellness (Zajacova & Lawrence, 2018). For example, educational attainment is highly related to income and employment, which facilitate access to the basics of health and wellness: nutritious food, living in a healthy and safe environment, and having access to competent medical care when needed. Furthermore, education can facilitate accessing and utilizing health and medical information to promote living healthfully.

Environmental Quality

Environmental determinants of health are both natural and human-made (called the *built environment*). Natural environmental determinants of health include the quality of air, water, land, and the risks of harsh weather and climate change. The built environment includes buildings, homes, neighborhoods, transportation options, recreational settings, and exposure to toxic substances and other physical hazards. For example, millions of people in cities around the world are exposed to unhealthy levels of ozone and other air pollutants from automobile and power-plant emissions, thus increasing their risk of asthma and other respiratory conditions.

Table 1.1 Adverse Childhood Experiences (ACEs) Questionnaire

Four or more experiences carry a proportional risk for ill health as an adult. Numbers in parentheses indicate percentage affected in the original ACE study population.

Category	Examples
Abuse	**Emotional abuse:** A parent, stepparent, or adult living in your home swore at you, insulted you, put you down, or acted in a way that made you afraid that you might be physically hurt. (10.6%) **Physical abuse:** A parent, stepparent, or adult living in your home pushed, grabbed, slapped, threw something at you, or hit you so hard that you had marks or were injured. (28.3%) **Sexual abuse:** An adult, relative, family friend, or stranger who was at least 5 years older than you ever touched or fondled your body in a sexual way, made you touch his or her body in a sexual way, or attempted to have any type of sexual intercourse with you. (20.7%)
Household Challenges	**Mother treated violently:** Your mother or stepmother was pushed, grabbed, slapped, had something thrown at her, was kicked, bitten, hit with a fist, hit with something hard, repeatedly hit for more than a few minutes, or ever threatened or hurt by a knife or gun by your father (or stepfather) or your mother's boyfriend. (12.7%) **Substance abuse in the household:** A household member was a problem drinker or alcoholic or a household member used street drugs. (26.9%) **Mental illness in the household:** A household member was depressed or mentally ill or a household member attempted suicide. (19.4%) **Parental separation or divorce:** Your parents were separated or divorced. (23.3%) **Incarcerated household member:** A household member went to prison. (4.7%) **Emotional neglect:** No one in your family helped you feel important or special, you did not feel loved, people in your family did not look out for each other nor felt close to each other, and your family was not a source of strength and support. (14.8l%) **Physical neglect:** There was no one to take care of you, protect you, and take you to the doctor if you needed it, you did not have enough to eat, your parents were too drunk or too high to take care of you, and you had to wear dirty clothes. (9.9%)

U.S. Centers for Disease Control and Prevention, Kaiser Permanente. The ACE Study Survey Data [Unpublished Data]. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2016. https://www.cdc.gov/violenceprevention/childabuseandneglect/acestudy/about.html

Social Factors and Health: The COVID-19 Pandemic

The COVID-19 pandemic provided a horrific example of social factors affecting health. Among the sickest and those who died, social factors such as race, income, education, and access to health care explained the stark differences found in trauma related to COVID-19. Long-standing social inequities influenced a wide range of health and quality-of-life risks and outcomes (listed below) that, along with racism and its associated chronic stress, contributed disproportionately to being affected by COVID-19.

- **Social Determinant 1, Neighborhood and Physical Environment:** Where and how people live are major risk factors for COVID-19 infection and its catastrophic consequences. For example, low income can force people to reside in crowded living spaces or crowded neighborhoods that can inadvertently expose them to others who are infected. Low-income neighborhoods may lack reliable transportation to employment, health, and medical services. Stores offering healthy foods may be rare. Living near freeways and industrial plants expose residents to environmental pollution.
- **Social Determinant 2, Health and Medical Care:** Low income, joblessness, and racial segregation can contribute to lack of access to quality health care, health insurance, or linguistically and culturally responsive health care. Inequities in treatment may result in distrust of government and healthcare systems. Such barriers increase risks for poor health and health outcomes by limiting health promotion, disease and injury prevention, and condition-management practices.
- **Social Determinant 3, Occupation and Job Conditions:** Essential workers—those employed in healthcare facilities, farms, factories, food production and processing, grocery stores, and public

transportation—have increased risk of exposure to COVID-19. Their jobs generally require frequent or close contact with the public or other workers, involve activities that cannot be done from home and worksites that are not equipped with protective equipment and are not willing or able to make adjustments in working conditions to limit exposure to COVID-19. Also, they may have jobs that do not offer paid sick days, so they feel compelled to work in order to maintain an income even if infected.

- **Social Determinant 4, Income and Wealth:** Low income often means having significant debt and difficulty managing expenses, paying bills (including medical bills), and accessing affordable quality housing, nutritious food, and reliable child care.
- **Social Determinant 5, Education:** Low proficiency in speaking and reading English make it more difficult to obtain and understand health formation and to follow written materials intended to help lessen COVID-19 risk. Lower levels of educational attainment create barriers to quality job training and college entrance.

Disproportionate exposure and subsequent devastating health consequences from COVID-19 infection magnified the harm engendered by the unequal availability of social resources needed to ensure the health and well-being of all individuals.

Data from U.S. Centers for Disease Control and Prevention (2020). COVID-19 Racial and ethnic health disparities. (https://www.cdc.g ov/coronavirus/2019-ncov/community/health-equity/racial-ethnic-disparities/index.html).

Individual Behaviors

In regions of the world without vaccination, modern sanitation, and effective forms of infection and infestation control, people are at risk for a variety of diseases caused by viruses, bacteria, parasites of various kinds, and worms. COVID-19, tuberculosis, malaria, and Ebola are examples. These diseases account for 50% of annual deaths worldwide, principally in economically challenged regions.

Because of high-quality sanitation and medical care, with the exception of COVID-19 and other unexpected pandemics (see Chapter 9), residents of high- and moderate-income countries are at minimal risk for many kinds of fatal infections and infestations. Instead, these individuals are at risk for **lifestyle diseases** resulting from personal behaviors such as cigarette smoking; consuming too little fruits, vegetables, and whole grains and high levels of processed meats and industrial food products laden with added sugar and salt; and a sedentary lifestyle. Heart disease, for example, results primarily from poor diet consisting of highly processed manufactured foods, cigarette smoking, lack of exercise, high levels of stress, and high blood pressure (Mozaffarian & Glickman, 2019). Cancer is associated with poor nutrition, tobacco smoking, and exposure to hazardous substances in the environment. Other lifestyle diseases include lung disease from tobacco smoking, type 2 diabetes, and kidney disease from being overweight (see the Global Health box "Type 2 Diabetes as a Lifestyle Disease"), and suicide, homicide, and fatal accidents from stress and alcohol and substance abuse. Eight of the top 10 causes of death in the United States and Canada are from lifestyle diseases (**Table 1.2**).

Many lifestyle diseases are **chronic diseases**, meaning that they often persist for life, with ever-increasing dependence on the medical system and gradual lessening of the quality of life. Worldwide, between 50% and 60% of health expenditures are for treatment of chronic diseases that are largely preventable by changes in unhealthy living habits. Whereas at some level each individual is responsible for her or his lifestyle decisions, scientists and health professionals know that community, state, national, and international efforts are needed to

Table 1.2 Top 10 Causes of Death in the U.S and Canada, 2019

Disease	Rank	
	U.S.	Canada
Heart disease*	1	2
Cancer*	1	2
Accidents (unintentional injuries)*	3	3
Chronic lower respiratory diseases	4	5
Stroke (cerebrovascular diseases)*	5	4
Alzheimer's disease	6	8
Diabetes*	7	6
Nephritis, other kidney disease	8	7
Influenza and pneumonia	9	10
Intentional self-harm (suicide)*	10	9

*Indicates lifestyle disease

Data from U.S.: National Center for Health Statistics https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm. Canada: Statistics Canada https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310039401

Type 2 Diabetes as a Lifestyle Disease

Diabetes is a disease in which the amount of sugar in the blood increases to unhealthy levels as a result of malfunctions in the body's sugar-regulating system. There are two forms of diabetes:

1. **type 1 (insulin-dependent)** in which the pancreas (a digestive organ) is diseased and unable to manufacture the hormone insulin, which regulates the level of sugar in the blood; and
2. **type 2 (non–insulin-dependent)**, which is caused by too much fat in the blood (generally from being overweight) and results in the body becoming resistant to the actions of insulin (*insulin resistance*).

In 2021, approximately 8.5 % of the world's population—463 million individuals—were affected by type 2 diabetes. Type 2 diabetes is a major cause of blindness, kidney failure, heart attacks, stroke, and lower limb amputation. About 10% of North American population has type 2 diabetes. Worldwide, type 2 diabetes is responsible for approximately 4 million deaths each year, making it the seventh leading cause of death in the world. The disease affects people of all ages and males and females equally. The global prevalence of type 2 diabetes is projected to increase to 700 million individuals by 2045.

The global epidemic of type 2 diabetes is considered to be the result of rapid worldwide economic development and urbanization in the last part of the 20th century. When people moved to cities for work, their living habits changed from consuming traditional diets that were somewhat balanced and moderate amounts of body movement to the consumption of unhealthy, processed, manufactured, and fast foods and a sedentary lifestyle. This is the reason type 2 diabetes is strongly associated with being overweight (Khan, Hashim, King, & Kahn, 2019). For every 20% increase in overweight, the chance of developing type 2 diabetes doubles. Type 2 diabetes is costly and often medically challenging to treat. Rather than drugs to control the medical consequences of type 2 diabetes, it is better for patients to eat healthfully and to engage in regular body movement (Nutrition Source, 2020). As shown in China, Finland, India, Japan, and the United States, community-based health programs are an effective way to help individuals prevent the onset of type 2 diabetes (Shirinzadeh, Afshin-Pour, Angeles, Gaber, & Agarwal, 2019). These programs offer individual and group-based educational sessions to help persons attain a healthy diet and incorporate movement and stress reduction activities into their lives.

World Diabetes Day is November 14 (https://worlddiabetesday.org/).

Profiting from Making People Sick

Heart disease, stroke, lung cancer, colon cancer, type 2 diabetes, and chronic obstructive pulmonary disease account for nearly half of all deaths in the United States. These diseases are caused in large part by unhealthy lifestyle choices: eating poorly, smoking cigarettes, being overweight, and not exercising. Unfortunately, many businesses profit from individuals' unhealthy lifestyles—indeed, some encourage unhealthy behavior as the basis of their business (Allen, 2019).

The tobacco industry is the prime example of profiting financially from harming others. No other industry makes a product that, when used as directed, causes disease and death. Knowing that long-term smokers (i.e., their best customers) tend to begin smoking as teens, the tobacco industry uses sophisticated marketing methods to lure young people to smoke and to get them hooked. The tobacco industry is a friend to no one.

Whereas it is not as obvious as with tobacco, some food companies also profit from harming their customers. A typical serving of fast food (e.g., burger, fries, and a soft drink or shake) contains around 1,000 calories, about half or more of most individuals' energy requirement for one day. This is why a steady diet of fast food can lead to weight problems and associated illnesses like type 2 diabetes.

Some of America's largest corporations are in the business of supplying consumers with less-than-healthy amounts of sugar (**Figure 1.1A**). The sugar is contained in packaged foods (from ketchup to breakfast cereals),

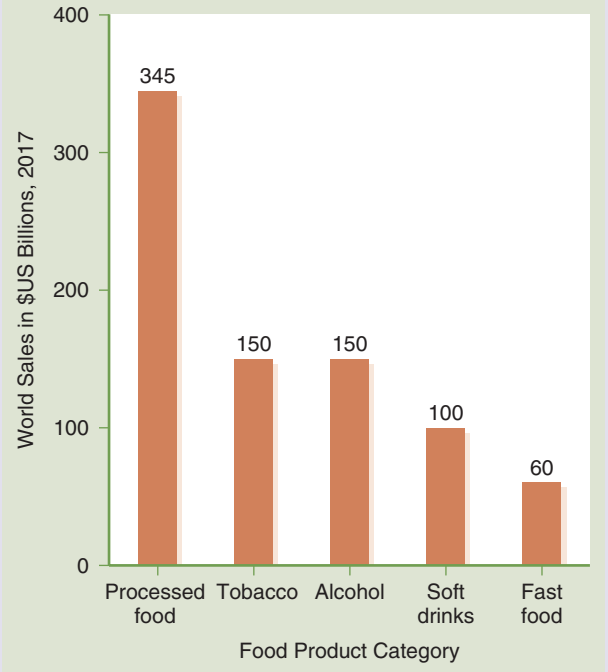

Figure 1.1A Sales Figures for 33 Leading Transnational Corporations in 2017 by Sector.

snack foods, fast foods, and sugar-sweetened beverages such as sodas, energy drinks, and sports drinks. Sugar-sweetened beverages alone deliver 36% of the added sugar that Americans consume, contributing to the risk of heart

disease and type 2 diabetes. And, unlike other products to which sugar is added, sugar-sweetened beverages have no nutritional value; they can readily be replaced by healthy beverages such as water and low-fat milk. Efforts to limit the damage to health from added sugar in food include taxing sugar-sweetened beverages to lessen consumption, particularly among youth, and encouraging food companies to voluntarily reduce the amount of sugar added to their products.

You need not wait for the actions of government and industry to better your health. You can start today by adopting healthy living habits, being mindful of others attempts to profit from distributing ill health, and being especially wary of health, medical, and pharmaceutical drug advertising.

help individuals make healthy lifestyle choices (see the previous Global Wellness box on COVID-19). For example, schools and businesses can encourage food services to provide healthy items. The stairwells of office buildings can be made visually attractive to encourage walking stairs instead of riding elevators. Businesses can organize group walks for employees during breaks; they can also offer financial incentives for adopting healthy living habits. Municipalities can ensure that new subdivisions have sidewalks, bike lanes, and parks. Governments can impose taxes on health-harming products (e.g., sugar-sweetened drinks and tobacco products) to reduce consumption, insist that consumers be made aware of the content and risks of manufactured foods, and be ever watchful that manufacturers ensure food and product safety. Governing bodies can create laws that enhance individual and public safety—for example, cleanliness in food manufacturing, ordinances prohibiting smoking in public spaces, and fuel efficiency standards for fossil fuel powered vehicles.

Health Status

Health status is an individual's state of health and wellness, taking into account the presence of disease, disability, and the individual's self-rated assessments of her or his overall physical, mental, and social health and the degree of meaning and purpose in his or her life (VanderWeele, 2019) (**Figure 1.2**). Note that some people perceive themselves as healthy despite having one or more chronic diseases, and others perceive themselves as ill when no biological evidence of disease can be found.

Optimal health and well-being include mental and physical health, happiness and life satisfaction, meaning and purpose, character and virtue, and close social relationships.

Health status can be scientifically measured (**Figure 1.3**). Some methods assess the status of a group, such as people living in a particular region, people of a certain age, or people with a certain disease or disability. The **incidence** of a given health condition refers to the number of people in a group who experience that condition in a given period of time, usually a year (e.g., "The incidence of breast cancer in the United States is 200,000 cases per year"). The **prevalence** of a given health condition is the total number of people in a group affected by that condition at the time of measurement (e.g., "In 2019, the prevalence of breast cancer among American women is 128 per 100,000 women").

Category	Description
Mental & Physical Health	Self-rated degree of physical and mental health
Financial Status	Self-rated concern about being able to meet normal living expenses
Happiness	Self-rated degree of current satisfaction with life
	Self-rated usual sense of happiness/unhappiness
Meaning & purpose in life	Self-rated extent that life activities are worthwhile
	"I know my purpose in life."
Close personal relationships	Contentment and satisfaction with current relationships and friendships
Character	Strive to promote good in all (even challenging) situations
	Willingnesss to forego some happiness in the present for greater happiness in the future

Figure 1.2 Components of Health and Well Being.

Data from VanderWeele, T.J. (2019). Reimagining Health ¨ Flourishing. *Journal of the American Medical Association*, 321, 1667–1668.

You can observe a lot just by watching.

Yogi Berra

Measuring Method	What is Measured
Years of Potential Life Lost (YLL)	Total number of years not lived by people who die for whatever reason before reaching a given age.
Disability Adjusted Life Years (DALYs)	Total number of years lived with illness or disease limits life in some way.
Physically and Mentally Unhealthy Days	Reported for the prior 60 days.
Chronic Disease Prevalence	Reported for either cardiovascular disease, arthritis, diabetes, asthma, cancer, and chronic obstructive pulmonary disease (COPD).
Limitation of Activity	Due to physical, mental, or emotional problems
Self-assessed Health Status	Individual perception of his or her health rated as excellent, very good, good, fair, or poor.
Health Related Quality of Life	An individual's or a group's perceived physical and mental health over time and the impact of preventable diseases, injuries, and disabilities on the quality of life.

Figure 1.3 Scientific Measures of Health Status.

Health: United States

For decades the United States has been the wealthiest nation in the world. Given this wealth and the fact that in the last 100 years, more U.S. scientists have been awarded the Nobel Prize in physiology and medicine than any other country, the health status of the American population is far lower than nearly all countries of equivalent income (e.g., Australia, Canada, France, Germany, Italy, Japan, Netherlands, Norway, Spain, Switzerland, and the United Kingdom) (**Figure 1.4**).

Compared to individuals in peer countries, Americans have shorter life expectancy, more mothers dying when giving birth, and more people with chronic diseases such as high blood pressure, cancer, and diabetes. This incongruous situation is so even though annual per-person

Health Measure	U.S. Rank
Life expectancy from birth in years	12th
Maternal mortality (%/100,000)	12th
Infant mortality (%/1000 live births)	12th
Mortality rate (deaths/yr/100,000 population)	12th
Premature deaths (YLL)***	12th
Years living with disease (DALYs)****	12th
Doctors/1000 population	11th
Spending on pharmaceuticals & medical devices	1st
Percent with some health insurance	12th
Daily smokers	12th
Death rate for poor mental health and substance abuse	1st
Alcohol consumption (liters/person/yr)	5th
Percent with Alcohol Abuse Disorder	2nd
Opioid deaths/1 million inhabitants (2018)	1st
Percent overweight/obese	1st
Percent overweight children	1st
Air pollution deaths/yr	3rd
Heart Disease mortality/100,000 persons	1st
Stroke mortality/100,000 persons	7th
Cancer incidence/100,000 persons	2nd
Cancer mortality/100,000 cases	5th
Diabetes prevalence/100,000 persons	1st
Suicide/100,000 persons	2nd
Self-rated health	
% bad or very bad	12th
% good or very good	2nd

Source: Organization for Economic Development and Cooperation (2019) *Health at a Glance*. 2019: OECD Indicators. Paris: OECD Publishing, Paris, https://doi.org/10.1787/4dd50c09-en.

Figure 1.4 Health Care Quality Comparisons Among High Income Countries. With regard to a variety of measures of health, the United States consistently ranks well below these high-income countries: Australia, Canada, France, Germany, Italy, Japan, Netherlands, Norway, Spain, Switzerland, and the United Kingdom.

Data from "Health at a Glance, 2019." OECD Indicators. Paris: OECD Publishing. https://doi.org/10.1787/4dd50c09-en

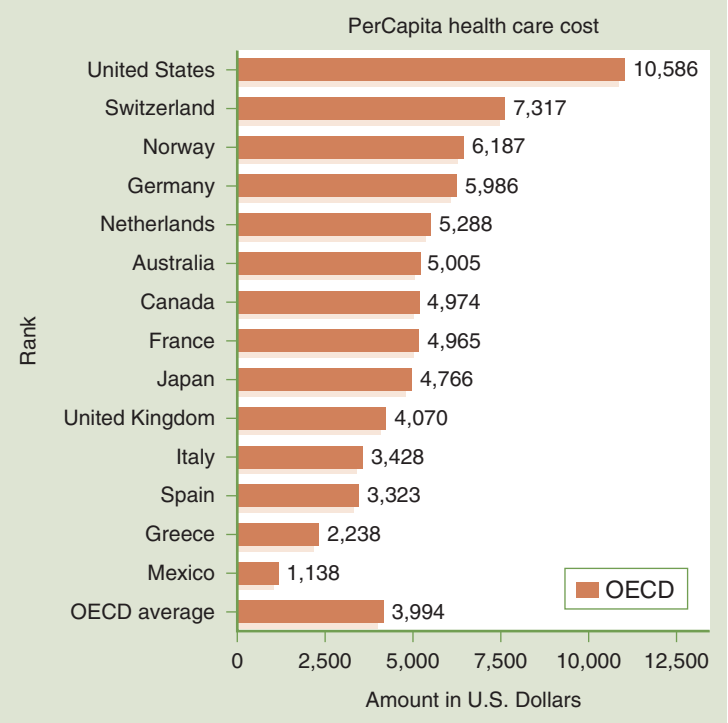

Figure 1.5 Healthcare Cost Comparison Among High Income Countries.

Data from OECD (2019), *Health at a Glance 2019: OECD Indicators*, OECD Publishing, Paris, https://doi.org/10.1787/4dd50c09-en

OECD is the Organisation for Economic Co-operation and Development, oecd.org

expenditures for medical care in United States far exceed those for individuals living in peer nations (**Figure 1.5**).

Some of the reasons healthcare costs are greater in the United States than in peer countries include the following:

- In most other high-income countries, there is little or no personal cost for medical care, including pharmaceuticals. In contrast, many Americans encounter financial barriers to accessing medical care because they lack health insurance or cannot afford co-pays and medicines with the insurance they do have.
- A 2019 study conducted by the Ways and Means Committee of the U.S. House of Representatives revealed that the average per-person cost of pharmaceuticals in the United States—about $1,200 per year—is twice that of peer countries. Other than the United States, every high-income country negotiates prices with pharmaceutical manufacturers, thereby ensuring the lowest costs. In 2000, the U.S. Congress made negotiating drugs prices illegal, except for the Veterans Administration. Therefore, in the United States, drug companies can charge whatever they want for medicines—and do! (See **Table 1.3**.)

Table 1.3 Cost Comparison of Some Prescription Drugs

	Cost ($USD)			
Drug	**United States**	**Canada**	**India**	**United Kingdom, Australia, New Zealand**
Celebrex (200 mg)	13.72	1.91	1.05	0
Paxil (20mg)	6.83	2.98	0.98	0
Nexium (40mg)	7.78	3.37	0.35	2.21
Viagra (100mg)	58.72	10.77	4.44	8.31
Nasonex (50mcg)	648.00	132.53	50.00	113.92

Data from U.S. Drug Prices vs. the World (2019). DrugWatch. https://www.drugwatch.com/featured/us-drug-prices-higher-vs-world/

Table 1.4 Effects of Income Inequality on Health Measures of U.S. Adults (2018) in Percentages

Health Measure	Income Level*		
	Low	Medium	High
Insufficient exercise	53.5	43.2	32.0
Limitation from chronic diseases	24.3	12.4	7.1
Self-rated *poor* health status	22.9	11.2	5.0
Current cigarette smoker	22.3	14.0	7.1
No health insurance	20.2	11.5	4.2
Nervous or distressed	18.8	9.2	1.6
Sad, hopeless, worthless (depressed)	15.8	7.4	2.3
Emphysema or bronchitis	8.0	4.8	2.8

*Low income = <$35,000/yr.; medium income = $50,000–$75,000/yr.; high income = >$100,000/yr. Data from U.S. Centers for Disease Control and Prevention, National Health Interview Survey, Summary Health Statistics Tables P-1a, P-11a, A-7a, A-8aA-11a, A-12a, A-14a, 2018. https://www.cdc.gov/nchs/nhis/SHS/tables.htm

- Many Americans have unhealthy living habits, consuming low-quality foods, which predisposes them to being overweight or obese; abusing alcohol and other drugs; being less likely to use seat belts; being involved in traffic accidents that involve alcohol; and using firearms in acts of interpersonal violence and suicide (Mokdad et al., 2018).
- Although Americans' average income is higher than those in peer countries, the United States also has higher levels of poverty (especially child poverty), income inequality, lower rates of social mobility, and lower levels of educational attainment. These economic and social disparities create **health disparities**—that is, differences in health status based on race, income, educational attainment, and access to healthy food, healthy environments, and quality medical care (**Table 1.4**).
- U.S. communities and the built environment are more likely than those in peer countries to be designed around automobiles, which discourages physical activity and increases exposure to air pollution from auto emissions.

How Much Money Is a Life Worth?

When U.S. federal agencies consider adopting new regulations intended to promote health or prevent injury or death, they try to figure out if the new regulations will be cost-effective and whether the gain in health is worth the cost to attain it.

For example, let's assume that of the several thousand water systems in the United States, 2,000 would have to spend a combined total of $3 billion to modernize so that arsenic levels could be reduced to required (safe) levels. Let's also assume that spending this $3 billion would save the lives of 60 people per year who would otherwise die of arsenic toxicity. If the costs of modernizing the water systems were spread over 20 years, then the $3 billion would save $20 \times 60 = 1{,}200$ lives. That works out to $2.5 million per life saved.

Is the new regulation worth the cost? Most definitely, according to *value of a statistical life* (VSL) calculations used by most federal agencies. Although each agency has its own specific VSL, the values for early and middle-aged adults tend be between $6 million and $9 million per life; the VSL for someone age 65 or older is about half that for someone in middle age. The VSL represents how much a person or employer is willing to pay to greatly reduce or eliminate a fatal risk. It is not based on earning power, an estimate of one's contribution to society, or how much someone is loved by family and friends.

It's been pointed out that $6 million to $9 million per life seems reasonable until you're talking about yourself or someone you care about. Then, the dollar value of a life is close to infinite.

Healthy People 2030

Each decade, the U.S. government issues a set of health objectives for the nation to be accomplished in the ensuing 10 years. The current set of health objectives is called *Healthy People 2030* (Healthypeople.gov). The main goals of *Healthy People 2030* are to:

- promote, strengthen, and evaluate the nation's efforts to improve the health and well-being of all people;
- eliminate health disparities, achieve health equity, and attain health literacy to improve the health and well-being of all;
- provide data that can drive targeted actions to address regions and populations with poor health or at high risk for poor health in the future; and
- distribute across national, state, tribal, and community levels and public, private, and not-for-profit sectors responsibility for promoting and achieving health and well-being and to develop and make available financially affordable means of health promotion, disease prevention, and treatment.

To attain its main goals, *Healthy People 2030* identifies hundreds of specific health objectives. Examples of *Healthy People 2030* objectives include the following:

- Reduce consumption of calories from added sugars in the population aged 2 years and older.
- Reduce the proportion of persons who are unable to obtain or delay in obtaining necessary medical care.
- Reduce firearm-related deaths.
- Increase the proportion of retail food store delis where foods displayed or stored hot are held at the proper temperature.

Healthy People 2030 recognizes that families, schools, worksites, communities, states, and national organizations must help individuals behave healthfully. This means not only that individuals are asked to make healthy lifestyle choices based on sound health knowledge but also that communities and organizations strive to provide quality education, housing, and transportation; health-promoting social and physical environments; and access to quality medical care. For example, informing people that it is healthy to consume five servings of fresh fruits and vegetables each day is insufficient if their community does not have stores or other sources of healthy food. Also, advising people to walk more is insufficient if their communities are not safe or lack parks or sidewalks.

Health Issues of North American College Students

About 23 million people attend North American colleges and universities. Two-thirds of those students are under 25 years of age. Among the most common health issues reported by North American college students are insufficient exercise, less-than-recommended consumption of fruits and vegetables, stress, and haphazard contraceptive use (**Table 1.5**).

Table 1.5 Common Health-Related Issues Reported by American College Students (Percentage)

Health-Related Issue	Male	Female
Not meeting movement activity guidelines	25	31
Daily consumption >1 sugar-sweetened beverage	65	67
Daily consumption <3 servings fruits or vegetables	52	51
Tanning >1 time in previous 12 months	41	63
Not having dental exam in previous 12 months	25	25
Contraceptive use in previous vaginal intercourse	88	89
Sexual abuse or assault in prior year	6	19
Intimate partner abuse, violence in prior year	17	19
Allergies (pollen, grass. pets)	37	49
Overweight (BMI >25)	37	34
Human papilloma vaccination	49	62
Cold or flu	41	58
Urinary tract infection	1	15
4+ sexual partners in previous year	16	14
Psychological distress	38	43
Loneliness	48	51
Challenges with procrastination	72	73
Challenges with academics	44	47

American College Health Association, 2020.

Some typical health issues facing college students include the following:

Mental health. Students are exposed to a variety of stressors and pressures that can impair their mental health. Academic overload, tests, and competition can create feelings of insecurity, anxiety, inferiority, and depression. Traditional students may be lonely and have difficulty adjusting to early adulthood. Nontraditional students may feel isolated and without social support. Stress can impair sleep and lead to depression.

Food and weight. Time pressures and the easy availability of junk food induce many students to consume lots of sugar (candy, sodas) and saturated fat (fast food) and insufficient amounts of fruits and vegetables. Students may use food to cope with stress and uncomfortable emotions. Many students are overly concerned about their body size and shape to meet social expectations of attractiveness, causing some to develop eating disorders. Many college students are among the two-thirds of North American adults who are overweight. Thus, weight control is an issue for many students.

Health care. A large proportion of U.S. college students has limited access to health care because their colleges do not have

comprehensive services and they are without health insurance.

Substance use and abuse. Many students use tobacco, vaping, alcohol, and other drugs to cope with stress and unpleasant feelings or to fit in socially. Alcohol abuse is related to sexual assault and date rape, unintended pregnancies (from not using contraceptives properly or at all) and acquiring a sexually transmitted disease (STD) from not practicing safer sex.

Sexual and relationship health. Sexually active students of any age are at risk for acquiring an STD, becoming unintentionally pregnant, or becoming involved in sexual assault, especially acquaintance or date rape. Sexual activity to relieve academic stress, increase self-esteem, gain peer acceptance, or relieve loneliness can be mentally and spiritually damaging. Married students may find that the time and energy demands of college work create stress in their marital relationships.

Accidents and injuries. Many students commute to school, often rushing to and from work and home, and hence are at risk for automobile accidents. Alcohol-using students are at risk for auto and other kinds of accidents. Athletically active students are at risk for sports injuries.

Health issues, particularly stress and anxiety, are common impediments to academic performance (**Table 1.6**). Academic overload, tests, competition, career issues, relationship and family problems, and inadequate finances can create feelings of insecurity, anxiety, inferiority, and depression. Students can be lonely and have difficulty adjusting to campus life. Stress can impair sleep and also increase the risk for substance abuse.

Table 1.6 Health Impediments to College Student Academic Performance

Health Issue	Percentage Reporting
Stress	42
Sleep difficulties	25
Anxiety	31
Cold, flu, sore throat	24
Depression	25
Upper respiratory infection	11
Alcohol use	4
Poor health or death of someone close	14
Finances	14
Procrastination	47
Intimate Relationship	12

Data from Undergraduate Student Reference Group, Data Report, Spring 2020. American College Health Association Association, 2020. https://www.acha.org/documents/ncha/NCHA-III_SPRING-2020_UNDERGRADUATE_REFERENCE_GROUP_DATA_REPORT_updated.pdf

How to Be Healthy

Considerable research has identified personal behaviors that contribute to health and longevity. These include the following:

1. Not smoking cigarettes. If you now smoke, quit. If you do not smoke, *never* start.
2. Quiet your mind ("destress") with meditation, prayer, exercise, yoga, dance, or a creative endeavor.
3. Engage in regular physical activity (20 minutes per day; 3–4 days a week).
4. Interact regularly with people whose welfare you care about and who care about yours.
5. Get sufficient sleep (for most adults about 7–8 hours per night).
6. Eat a complete or near-vegetarian diet (e.g., Mediterranean Diet).
7. Consume no more than 10% of daily calories from saturated fat.
8. Limit snacking on junk foods that contain saturated fat, sugar, and salt.
9. Drink no more than one (women) or two (men) alcoholic drinks per day
10. Maintain a healthy body weight.

Surely, almost everyone wants to be healthy and well. Yet many people develop habits of thought and behavior that make them less well rather than more. Perhaps they are unaware of the ways in which some of their current life habits contribute to poor health. Or perhaps they know that changing certain health habits would be beneficial but they do not know how to make those changes.

It is said that knowledge is power, but with regard to living healthfully, that isn't always the case. Almost everyone knows that smoking cigarettes, driving after drinking alcohol, and eating junk food are unhealthy, but many people do those things anyway. Simply knowing what to do is no guarantee that a person will do it.

If you find yourself in a hole, stop digging.

—Will Rogers, American comedian, actor, and writer

One must act. Living healthfully requires action based on accurate knowledge. Action has the components of setting goals, developing strategies for attaining goals including managing obstacles and expectations of whether you will be successful (called *outcome expectancies*).

Goals

A goal can be something you want or something you want to prevent or avoid. There are short-term goals ("I want to get a good night's sleep") and long-term goals ("I want to get my degree"). Goals can be clearly defined ("I'm going to study this Friday night instead of partying") or fuzzy ("I want to do better at school").

Goals reflect a person's or a culture's values, which are beliefs about what is important. Two values that affect health are valuing oneself (**self-esteem**) and valuing the physical and social environments in which one lives. When you value yourself, you are more likely to engage in healthful behaviors and have a high degree of psychological well-being. When you value your physical and social environments, you are more likely to contribute to making them clean, healthy, and supportive in helping others to attain their goals.

Strategies for Action

Strategies involve generating a variety of possible paths (brainstorming) and evaluating the ones with the greatest likelihood for success. Knowledge sought from others should be evaluated critically to be sure it is authoritative and authentic and not solely for the other's financial gain. Besides planning, people assess whether they have the resources and ability to carry out the actions to accomplish their goals.

Expectations for Success

People pursue goals with expectations about the outcomes of their efforts. **Optimism**—imagining a high probability of attaining a goal—motivates, whereas **pessimism**—imagining a low probability of attaining a goal—stifles. Optimism is associated with perceiving negative events as specific, temporary obstacles to be overcome, whereas pessimism is associated with explaining negative events as self-caused (it's my fault), stable (it will last forever), and global (it's going to ruin everything).

Optimism also is associated with the tendency to perceive oneself as being able to move toward a desired goal or away from an undesirable goal. Optimism is associated with inner self-talk that is encouraging and hopeful ("I'll find a way to solve this problem"). On the other hand, the self-talk associated with pessimism is anxious ("I'm not sure what to do"; "I'm not sure it will work out") and self-critical ("I'm inept").

One reason people resist making healthy lifestyle changes is that an unhealthy attitude or behavior is rewarding in some way, even if it is harmful in some other way (e.g., smoking cigarettes to relieve stress). To change a health behavior, a person must believe that the benefits of change outweigh the costs and that she or he is capable of making the desired change. Rituals such as New Year's resolutions and slogans such as "Just Do It" offer unrealistic models of how habits are changed. Desire and willpower alone are insufficient; research, planning, patience, taking a step at a time, and enlisting social support are required as well. Following are three models that describe the process of health behavior change.

The Health Belief Model

The **Health Belief Model** has the following key aspects:

- **Perceived susceptibility.** Individuals vary widely in their perception of susceptibility to a disease or adverse health condition. Some deny the possibility of contracting an adverse condition. Others admit to a statistical possibility of disease susceptibility. And still others believe there is real danger that they will experience an adverse condition or contract a given disease.
- **Perceived seriousness.** This refers to the beliefs a person holds about the effects of a given disease or condition on his or her life—for instance, pain and discomfort, loss of work time, financial burdens, difficulties with family, problems with relationships, and susceptibility to future conditions. It is important to include these emotional and financial burdens when considering the seriousness of a disease or condition.
- **Perceived benefits of taking action.** The action a person chooses will be influenced by his or her beliefs regarding the benefits of the action, particularly if the benefits outweigh the perceived costs.
- **Barriers to taking action.** Barriers such as inconvenience, cost, unpleasantness, pain, or upset may lead a person away from taking the desired action.

- **Cues to action.** Evaluation of benefits minus barriers provides the path of action. However, "cues to action"—either internal or external—may be required for the desired behavior to occur. An internal cue can be a sign, symptom, or feeling interpreted by someone as a health issue that needs attention. An external cue is a suggestion from someone that it's a good idea to participate in some health-related activity.

The Transtheoretical Model

The **Transtheoretical Model** proposes that a health behavior change occurs through the following stages:

- **Precontemplation.** The person is not considering changing a particular behavior in the foreseeable future. Many individuals in this stage are unaware or barely aware of their vulnerability. Information is important during this stage.
- **Contemplation.** The person becomes aware that change is desirable but has not committed to act. The person often focuses on why it would be difficult to change. Information on options on how to change the behavior can be helpful during this stage.
- **Preparation.** The person desires change and commits to making that change in the near future, usually within the next 30 days. Instead of thinking why he or she can't take action, the focus is on what can be done to begin. The person creates a realistic plan for making a change, including overcoming obstacles. This stage may include announcing the change to friends and family, researching how to make the change, making a calendar, or setting up a diary or journal to record progress and obstacles to progress.
- **Action.** The person implements the plan. The old behavior and the environmental situations that reinforced it are stopped and new behaviors and environmental supports are adopted. Obstacles are expected and noted, and strategies for overcoming them are implemented. Progress through this stage may take 6 months or more.
- **Maintenance.** The person strengthens the change, recognizing that lapses and even temptations to give up will occur. "Ebb and flow" is to be expected and should not be seen as failure. The person can remind himself or herself of the many benefits of and gains from the behavior change to help combat relapse.
- **Termination.** The person is not tempted to return to the previous behavior.

The Theory of Reasoned Action/Theory of Planned Behavior

The **Theory of Reasoned Action** or **Theory of Planned Behavior** proposes that changing a health behavior begins with an intention to adopt a new behavior (e.g., stop smoking). The intention is a combination of a positive attitude about performing the behavior (e.g., "Not smoking is good") and the person's thoughts about how others will respond to the new behavior (e.g., "My girlfriend will be happy if I stop"). Furthermore, change is affected by the person's perceptions of how much control he or she has over bringing about the desired change (e.g., "I can do this if I get some support").

Health Starts with Each of Us

It is clear from many kinds of health research that each one of us needs to do more to maintain and improve our health. When one is young, thinking about health is the last thing one is interested in doing. We (the authors) certainly did not worry about our health when we were teenagers or even in college. Moreover, 50 years ago, eating as much meat as you could afford, smoking cigarettes, and getting drunk were generally accepted behaviors. When you are 20 years old, thinking about living to 60 or 70 years of age is unimaginable. Unlike 50 years ago, we now know that protecting health is something that has to begin while you are young. Making lifestyle changes when you already are old (and presumably wiser) is mostly too late.

Health is similar to retirement: It is something you have to plan for and pay attention to while you are young. For example, putting away just a few dollars every month adds up to an enormous sum in 50 years, but most of us never think about doing it. The same holds true for health. Making small, positive changes in your health and lifestyle now will pay enormous dividends in the future.

After a resounding victory over the British Navy in the Battle of Lake Erie in the War of 1812, U.S. Naval Commander Oliver Hazzard Perry proclaimed, "We have met the enemy and they are ours." To commemorate Earth Day 1971, American cartoonist Walt Kelly enlisted his creation, "Pogo the Opossum," to proclaim, "We have met the enemy and he is us!"

Since the latter part of the 20th century, Earth's 7.6 billion human inhabitants have

Figure 1.6 Pogo the Opossum.

Reproduced from Print 1980. The Walt Kelly Estate. Published by Swamp Yankee Studio. Box 2311, Bridgeport. CT 06608.

increasingly become challenged by a set of threats to their health and well-being. The gravest is global climate change resulting from a rapid increase of carbon dioxide in Earth's atmosphere from the burning of fossil fuels for energy. Today, no one could blame Pogo (see **Figure 1.6**) were he to reissue his 1971 proclamation with regard to climate change, as well as several global viral pandemics such as the recent SARS-CoV-2 (COVID-19), epidemics of heart disease, type 2 diabetes, sexually transmitted infections, depression, and anxiety, and the ever-present threat of nuclear conflict.

As Pogo might say, "Everyone's health is up to us!" Each of us is responsible for our overall health and well-being. We determine the ways our thoughts, feelings, and behaviors contribute to or lessen our health; whether our dietary habits are healthy; how much we care for rather than harm ourselves; and contributing to developing and maintaining health-promoting economic, social, and physical environments.

Critical Thinking About Health

1. As pointed out in this chapter, the major health issues of college students are sexual health, mental health, substance abuse, weight, accidents and injuries, and health care. Discuss which of these issues is of most concern to you personally. Explain your reasons and worries. How can you deal with your concerns in a way that will improve your health?
2. Describe one lifestyle behavior you routinely engage in that you regard as harmful to your health (not exercising regularly, for example). Discuss your reasons for continuing to engage in this unhealthy behavior. Consider what you might do to change this behavior and list the steps you would take to accomplish the healthy change. Do you believe that you can make the healthy change?
3. Imagine that you are the surgeon general of the United States, who formulates national health policy. (One former surgeon general, the late C. Everett Koop, formulated the crusade against tobacco smoking a generation ago.) Describe what you believe is the primary health problem in the United States today. Justify your choice with as many facts as you can. Describe the steps you believe should be taken by government, private companies, organizations, and individuals to eradicate this health problem.

Chapter Summary and Highlights

Chapter Summary

The word *health* can have many meanings. For some, being healthy simply means not being sick. For others, physical health and strength matter most, and emotional and mental health are of lesser concern. For others, emotional and spiritual well-being are paramount. If you are concerned with *all* aspects of your health, then you think of health holistically. A holistic approach to health means that you strive for physical, mental, emotional, and spiritual well-being. You also try to live in harmony with your environment and with friends, family, and society.

Many people born since 2000 will live to 100 years of age or more. Adopting healthy lifestyles while young will help ensure a healthy old age. Most people are born healthy but become unwell because of unhealthy lifestyles. Chronic diseases such as heart disease, cancer, diabetes, and others are primarily the result of unhealthy lifestyle choices such as smoking tobacco, drinking alcohol to excess, consuming low-quality foods, and a lack of regular physical exercise. Maintaining a healthy body and mind will help you recover from occasional sickness and injuries that are inevitable parts of life.

The path to physical, mental, emotional, and spiritual health is to set health goals for yourself beginning

now. Adopt healthy habits that feel right for you. Perhaps the most important word to remember in striving for a healthy lifestyle is *moderation*. Eat when hungry and do not eat more once you are full. Refrain from mindless snacking when bored or while engaged in sedentary recreational activities (watching TV, playing video games, using social media). Make movement a part of your daily life. Walk more, use stairs instead of elevators, ride a bike, dance, or do yoga. And be sure to take time to quiet your mind, especially when you are angry, stressed, or upset.

Health does not come from outside ourselves. The key to a healthy life has always been self-responsibility. Doctors, hospitals, drugs, and government rules cannot make you healthy. They can help prevent illness and injuries and often restore body and brain to a semblance of normal functioning. But you are always the one responsible for your moment-to-moment, day-to-day health.

Highlights

- Health is not only the absence of disease but also living in harmony with oneself, friends and relatives, and social and physical environments.
- The World Health Organization defines health as "a state of complete physical, mental, and social well-being and not merely the absence of disease and infirmity."
- Health means being responsible for preventing personal illness and injuries as well as knowing when to seek medical help.
- The dimensions of wellness are emotional, intellectual, spiritual, occupational, social, and physical.
- Determinants of health and wellness consist of personal biology, economic and social circumstances, environmental, and individual factors that affect individuals and communities.
- Many illnesses (e.g., diabetes, heart disease, cancer) are *lifestyle diseases*—that is, primarily attributable to unhealthy living habits. Taking responsibility for your health while you are young is the best way to reduce the risk of chronic disease later in life.
- Unhealthy lifestyles and behaviors are responsible for half of all deaths in the United States each year.
- The health status of Americans is lower than nearly all of its peer-income countries, principally because of high costs and the absence of rules regarding access to medical and health care.
- *Healthy People 2030* is a set of national health objectives characterized by enhancing the quality of life, reducing the incidence of preventable diseases and premature deaths, and reducing disparity in health status among different demographic groups.
- Health issues facing North American college students include stress, anxiety, depression, overweight, lack of health care, substance abuse, and sexual and relationship health.
- Changing health behaviors requires knowledge, planning, and social support.

References

Allen, L. N., et al. (2019). Corporate profits versus spending on non-communicable disease prevention: An unhealthy balance. *The Lancet*, https://doi.org/10.1.016/S2214-109X(19)30399-7

Felitti, V. J. (2009). Adverse childhood experiences and adult health. *Academic Pediatrics, 9*, 131–132.

Genetics. (2020). Genetic conditions. U.S. National Library of Medicine. https://ghr.nlm.nih.gov/condition

Healthypeople.gov (2021). *Healthy People 2030*. http://www.healthypeople.gov

Khan, M. A. B., et al. (2019). Epidemiology of Type 2 diabetes—Global burden of disease and forecasted trends. *Journal of Epidemiology and Global Health*. https://doi.org/10.2991/jegh.k.191028.001

Mokdad, A. H., et al. (2018). The state of U.S. health, 1990–2016: Burden of diseases, injuries, and risk factors among U.S. states. *Journal of the American Medical Association, 319*, 1444–1472.

Mozaffarian, D., & Glickman, D. (2019, August 26). Our food is killing too many of us. *The New York Times*.

Nutrition Source. (2020). Simple steps to preventing diabetes. T. H. Chan School of Public Health, Harvard University. https://www.hsph.harvard.edu/nutritionsource/disease-prevention/diabetes-prevention/preventing-diabetes-full-story/

Sartorius, N. (2006). The meanings of health and its promotion. *Croatian Medical Journal, 47*, 662–664.

Shirinzadeh, M., Afshin-Pour, B., Angeles, R., Gaber, J., & Agarwal, G. (2019). The effect of community-based programs on diabetes prevention in low- and middle-income countries: A systematic review and meta-analysis. *Global Health, 15*. https://doi.org/10.1186/s12992-019-0451-4

Statistics Canada. (2020). Leading causes of death, total population, by age group. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310039401

U.S. Centers for Disease Control and Prevention. (2016). About the CDC–Kaiser ACE ACE Study. Atlanta, GA: U.S. Department of Health and Human Services. https://www.cdc.gov/violenceprevention/childabuseandneglect/acestudy/about.html

U.S. Centers for Disease Control and Prevention. (2018). Tables of Summary Health Statistics, National Health Interview Survey. https://www.cdc.gov/nchs/nhis/SHS/tables.htm
U.S. Centers for Disease Control and Prevention. (2019). Disability and Health. https://www.cdc.gov/ncbddd/disabilityandhealth/index.html
U.S. Centers for Disease Control and Prevention (2020). COVID-19 Racial and ethnic health disparities. https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/racial-ethnic-disparities/index.html
U.S. Centers for Disease Control and Prevention. (2021). Adverse Childhood Experiences. https://www.cdc.gov/violenceprevention/childabuseandneglect/acestudy/index.html
VanderWeele, T.J. (2019). Reimagining health—Flourishing. *Journal of the American Medical Association, 321*, 1667–1668.
Williams, J. F. (1939). *Personal Hygiene Applied*. Philadelphia, PA: W. B. Saunders.
Zajacova, A. & and Lawrence, E.M. (2018). The relationship between education and health: Reducing disparities through a contextual approach. *Annual Review of Public Heath, 39*, 273–289.

Key Terms

well-being: qualities of life that include positive emotions (e.g., happiness, contentment) and life satisfaction
medical model: interprets health in terms of the absence of disease and disability
chi: universal energy that must be distributed harmoniously throughout the mind–body to attain and maintain health; also known as *qi*
wellness model: encompasses the physiological, mental, emotional, social, spiritual, and environmental aspects of health
physical wellness: maintaining a healthy body by eating right, exercising regularly, avoiding harmful habits, and making informed, responsible decisions about your health
emotional wellness: understanding emotions and knowing how to cope with problems that arise in everyday life and how to manage stress
intellectual wellness: having a mind open to new ideas and concepts
social wellness: ability to perform social roles effectively, comfortably, and without harming others
spiritual wellness: state of balance and harmony with yourself and others
occupational wellness: enjoyment of what you are doing to earn a living and contribute to society
environmental wellness: living in an environment characterized by clean air, water, and land that also supports basic human needs and is free of interpersonal violence and the threat of climate change
financial wellness: attaining and maintaining resources to meet physical, psychological, and social needs by planning for the future, preparing for unforeseen financial difficulties, and being aware of others' financial values, needs and circumstances
determinants of health and wellness: consist of personal, social, economic, and environmental factors that affect individual, community, and world health
lifestyle diseases: negative health conditions from personal behaviors such as cigarette smoking, poor diet, and a sedentary lifestyle
chronic disease: a disease that persists for years or even a lifetime
type 1 (insulin-dependent) diabetes: when the pancreas is diseased and unable to manufacture the hormone insulin to regulate the level of sugar in the blood
type 2 (non-insulin-dependent) diabetes: caused by too much fat in the blood (generally from being overweight), resulting in the body becoming resistant to the actions of insulin
health status: an individual's state of health and wellness, accounting for the presence of disease, disability, and the individual's self-rated assessments of overall physical, mental, and social health
incidence: the number of new cases of a particular disease
prevalence: the number of people within a population with a particular disease
health disparities: differences in health status based on race, income, educational attainment, and access to healthy food, healthy environments, and quality medical care
self-esteem: the judgment one places on one's self-worth
optimism: the thought process of imagining a high probability of attaining a goal
pessimism: the thought process of imagining a low probability of attaining a goal
Health Belief Model: health behavior change is a function of a person's perceived risks for behaving as usual and benefits from change
Transtheoretical Model: health behavior change starts with considering making a change followed by planning, implementing the plan, and overcoming obstacles theory of reasoned action: change begins with an intention to adopt a new behavior and doing so is beneficial
Theory of Reasoned Action or **Theory of Planned Behavior:** proposal that changing a health behavior begins with an intention to adopt a new behavior

CHAPTER 2

Mind–Body Harmony

Health Tips

- Make Up Your Own Mantra for Changing Behaviors
- Image Visualization Reduces Stress

Managing Stress

- Biofeedback
- Focusing Attention for Mind–Body Harmony
- Relaxation with Music

Wellness Guide

- Using Your Mind to Heal Your Body
- Self-Care: Mindfulness Meditation for Lifelong Well-Being
- Positive Thinking Has the Power to Improve Health

LEARNING OBJECTIVES

1. Describe three ways the mind and body communicate biologically.
2. Define psychosomatic illness.
3. Describe and give examples of the placebo effect and the nocebo effect.
4. Describe how faith, religion, and spirituality affect health.
5. Explain hypnotherapy.
6. Describe meditation and image visualization.

The mind is central to health and well-being. By *mind* is meant the brain processes that create thoughts, beliefs, attitudes, emotions, and the nature and quality of interactions with the social and physical environments. That the mind is anatomically and functionally connected to the entire body allows thoughts, beliefs, and feelings to affect the body's chemistry and physiology, and vice versa. This means that, with intention and attentional focus, to a large degree people can use their powers of mind to influence their health and well-being.

Considerable research shows that positive thoughts such as trust and love, and positive emotions such as happiness, contentment, and joy, can lead to states of mind–body harmony that motivate living healthfully, aid healing and recovery from illness and injury, and increase longevity (Moskowitz, Addington, & Cheung, 2019). Fear, anxiety, stress, and depression contribute to mind–body disharmony, which increases the risks for a variety of illnesses, impedes healing, and fosters a sense that life is difficult

and unpleasant. When your thoughts, feelings, and behaviors are in harmony within yourself and you live harmoniously within your social and physical environments, you are more likely to feel good and be in measurable good health than if you are chronically angry, frightened, stressed, depressed, and at odds with your surroundings (McEwen & Akil, 2020).

Mechanisms of Mind–Body Communication

The mind and brain and body form a unified whole. No mind exists without a body and no body exists without a mind. The mind–body seeks balance through alertness and adaptive responsiveness to changes in the body or the external environment. When adaptations to change proceed smoothy, we feel in sync with ourself, relaxed, confident, happy. When change is overly disruptive, we generally experience pain, fear, and anxiety to signal something is amiss.

To adjust to change, the mind and body communicate with each other. A simple example: On a walk in the woods, the hearing apparatus of the ears registers a sound. That information is transmitted to the brain, which interprets the sound as that of a hissing snake, even if no snake is visible. Based on prior learning, the brain interprets this situation as dangerous and activates the nervous system's fear networks, which in turn activate the brain's and body's movement systems to orchestrate a rapid escape.

The brain communicates with the body by means of the nervous, endocrine (hormone), and immune systems (see below). Sensory nerves register changes inside and outside of the body, and that information is transmitted to the brain. The brain assesses the nature of changes, often by comparing them to prior experiences stored in memory, and that information is transmitted to parts of the brain responsible for the body responding in the most healthful way.

The Autonomic Nervous System

A major pathway by which the mind and body communicate is through the **autonomic nervous system (ANS)**, a group of nerves that regulate many of the body's physiological processes, such as heart rate, blood pressure, breathing, and the functioning of the gastrointestinal, urinary, and reproductive systems (**Figure 2.1**). Centers in the brain receive information about the state of the body or environment (or both) and activate the nerve fibers of the ANS in response to maintain appropriate physiological balance. For

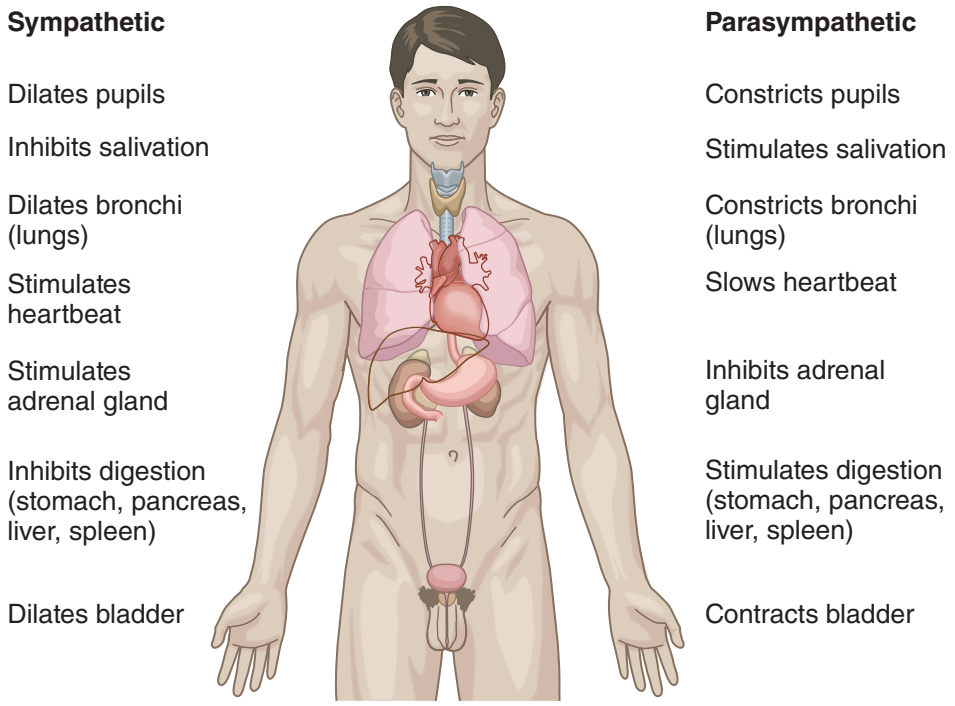

Figure 2.1 Functions Controlled by the Autonomic Nervous System. The autonomic nervous system has two parts or divisions—the sympathetic division and the parasympathetic division. These regulate functions that normally are not under conscious control such as breathing, digestion, and heart rate.

example, when you exercise, the ANS stimulates the heart's pacemaker cells to increase your heart rate, thus increasing the amount of blood pumped to moving muscles.

The autonomic nervous system derives its name from the fact that its activities normally operate without conscious control. Thus, when jogging, you do not think about how fast your heart should beat or whether you should sweat to cool yourself. Even though the ANS functions without conscious control, the signals it sends to the body can be affected by thoughts and feelings. For example, nearly all students are familiar with the nervous stomach and sweaty palms that accompany the stress of taking an important exam. Realizing that it is possible to do poorly on an exam (a thought) leads to anxiety (an emotion), which activates the ANS to produce test-anxiety symptoms. Fear has an immediate effect on breathing and heart rate, and stress can constrict blood vessels, causing headaches or high blood pressure.

Many students live fast-paced, hectic lives that are full of time pressures and stress. Besides doing school assignments, many students work at jobs, and nearly all try to maintain harmonious social relationships with family and friends, which take time and attention. Moreover, the modern environment is filled with smartphones, computers, the Internet, TV, video games, and other stimuli that compete for attention. Trying to accommodate all of life's demands produces near continuous physiologic arousal mediated by the sympathetic nerves of the ANS, causing anxiety, sleep disturbances, muscle tension, gastrointestinal symptoms, and an increased risk for cardiovascular disease among other things.

ANS-mediated arousal can be counteracted by putting 20 to 30 minutes or more of quiet time into your life each day. (If you must, schedule it in your day planner.) You can employ any of a number of techniques designed to lessen ANS arousal and create a sense of mind–body harmony. Or you can find a quiet spot in a park or a room where you can comfortably and silently reflect on and be grateful for the good things in your life, and let go for a time of the problems of the world and task you need to accomplish.

Hormones

Besides the autonomic nervous system, the mind can affect physiology via the endocrine (hormone) system. **Hormones** are chemicals produced by special organs and tissues in the body. There are about 20 different hormones. Each hormone regulates specific biological functions (**Figure 2.2**). Hormones notify the body of changes outside and inside the body that must be responded to in order to maintain health.

Many hormones respond to changes in thoughts and feelings. For example, if the mind interprets a situation as threatening or frightening, regardless of whether the danger is real or imagined, centers in the brain responsible for emotions signal other parts of the brain and body to release hormones such as adrenaline and cortisol into the bloodstream. These hormones circulate to several of the body's organs and tissues to make the mind and body alert and ready to deal with the danger. The brain hormone oxytocin stimulates feelings of closeness, affection, and emotional warmth.

Hormones manufactured in the brain can affect other areas of the brain; however, most hormones that originate in the brain are released into the circulatory system and travel throughout the body. Certain brain hormones have been associated with increases or decreases in particular feelings and behaviors (**Table 2.1**). Thus, the environment, the brain (mind), and hormones (chemical messengers) are intricately interconnected and ultimately can affect health.

The Immune System

Besides the ANS and endocrine system, the mind and body communicate via the **immune system**. The immune system is responsible for combating infections and ridding the body of foreign organisms and toxic substances. Immune system cells, tissues, and organs are located throughout the body. The immune system can be influenced by the mind via the nervous and endocrine systems. Nerves of the sympathetic nervous system connect to certain immune tissues such as

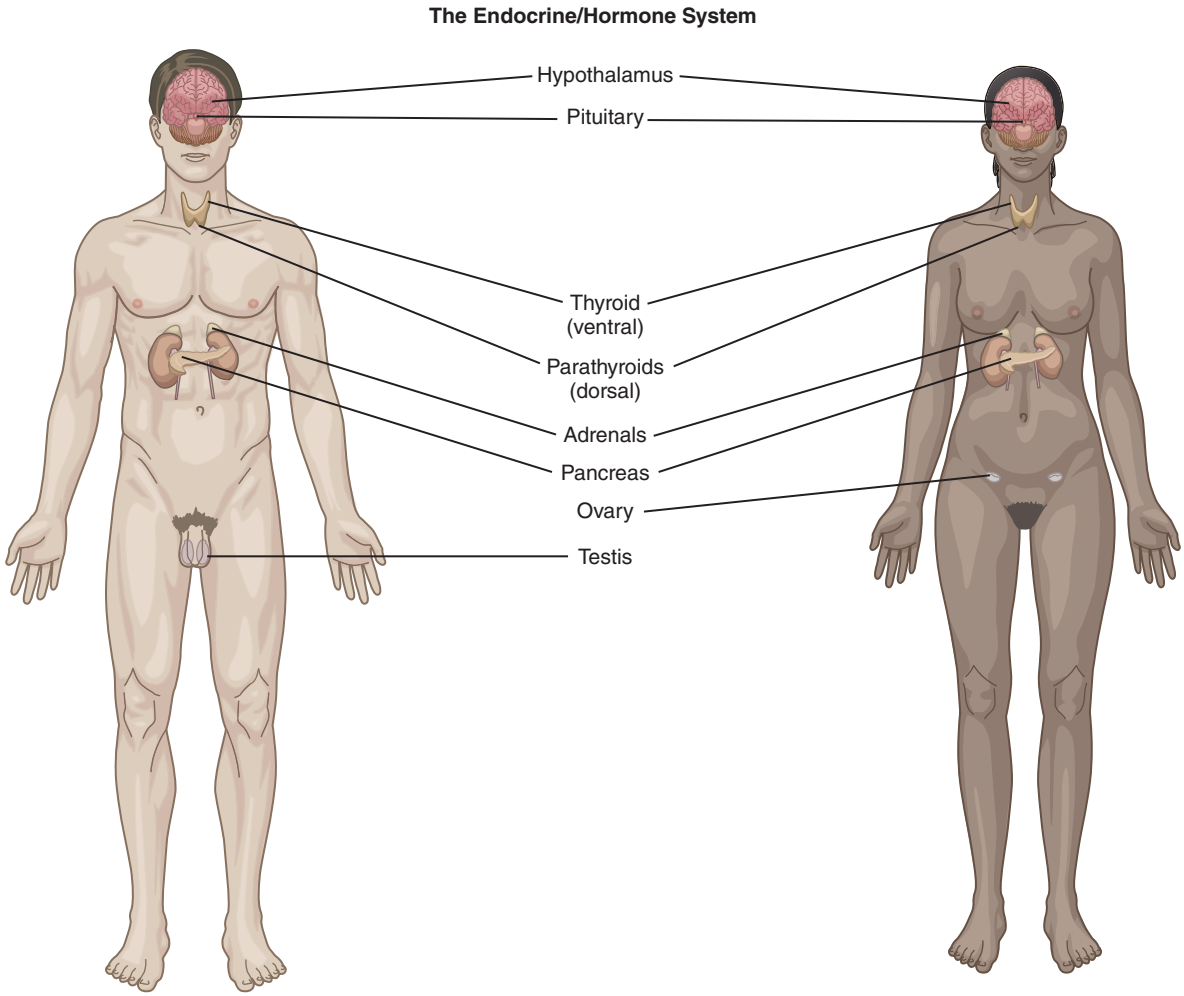

Figure 2.2 Where Hormones Are Released. Hormones are released from different glands and organs throughout the body, including the brain. The synthesis and release of these hormones are regulated by the mind and autonomic nervous system. Hormones are chemical messengers that tell organs in the body how to respond to stimuli.

Table 2.1 Hormone Levels Can Affect Moods, Thoughts, Feelings, and Behaviors

Hormone	Effects of High Levels
Cortisol	High blood levels of cortisol increase stress and alertness, decrease sensitivity to pain, impair memory processing, and increase depression.
Dopamine	High blood levels of dopamine increase pleasure and motivation and decrease sadness.
Oxytocin	High blood levels of oxytocin increase trust and feelings of attachment and decrease fear.
Vasopressin	High blood levels of vasopressin increase sexual arousal and attention but decrease anxiety.
Serotonin	High blood levels of serotonin increase aggression and obsessive thoughts.

bone marrow, lymph nodes, and spleen. Many immune cells respond to the presence of the hormone cortisol as part of the stress response. Moreover, the immune system releases special chemicals called *cytokines* that can affect the nervous and endocrine systems.

Many studies have demonstrated that the mind can affect the workings of the immune system. It is well known that stress and negative mood states can weaken the immune system and that methods to reduce stress such as mindfulness meditation and t'ai chi chuan strengthen immune response (Antoni, 2012). Positive emotions such as feeling calm and peaceful, happy, and optimistic about life can enhance immune function (Pressman & Black, 2012).

The Placebo Effect

A stark example of the mind's effect on wellness is the **placebo effect** (from the Latin "I shall please"), which refers to the lessening of symptoms or curing

Using Your Mind to Heal Your Body

Have you ever cut or burned your hand? Perhaps you were cutting food and the knife slipped, or perhaps you reached for a pan on the stove, forgetting that the handle was hot. The usual response to such accidents is anger at being careless or forgetful and anger at the sudden pain. We jump around and get upset, which generally exacerbates the injury and delays healing. A much better response to minor injuries that do not require immediate medical attention is the following.

In case of a cut, place a clean cloth over the wound and press gently to help stop the bleeding. Then sit or lie down. Close your eyes and allow yourself to become mentally and physically quiet. In your mind, visualize the injured part and see it as it was just before the accident. Then imagine the process of healing. See the skin coming back together. Feel the pain recede. Notice diminished bleeding. Continue doing this for 5 minutes or longer until you feel calm. If the accident caused a burn, place an ice bag or cool wet cloth over the wound. Then lie down and visualize the skin becoming cooler and looking like the normal skin around the burn.

By immediately calming the mind after an injury, inflammation and other harmful physiological reactions in the area are reduced. Healing processes begin immediately when you send positive, calming thoughts and images to the injured area. Continue to visualize healing in the injured area.

of a disease by a person's belief in the curative power of an inert medicine (called a *placebo* or *sugar pill*) or belief in the healing power of a person, special words, or objects. Although a placebo is often thought to be a fake medicine that tricks an unwell person into feeling better, in actuality a placebo produces identifiable biological changes. Healing is not imagined.

Placebos work because the expectation of effectiveness brings about real physiological changes that lead to healing. For example, researchers (Wager et al., 2004) exposed volunteers to harmless but occasionally painful electric shocks or heat. When the volunteers applied to their arms what they believed to be an antipain cream, which was really an inert substance—a placebo—they rated the pain as less intense. The placebo also lessened activity in brain regions associated with experiencing pain. The *expectation* of pain relief—a product of the mind—produced biological pain relief, a product of the body. Many variations of this experiment have further shown that the expectation of pain relief is associated with the manufacture and release of the brain's own pain-relieving chemicals (endorphins, enkephalins, and cannabinoids).

The placebo effect occurs in almost every medical treatment (Wager & Atlas, 2015), in many instances to a remarkable degree (**Figure 2.3**). The placebo effect is so common and powerful that the U.S. Food and Drug Administration (FDA) requires that a new drug undergo *double-blind, placebo-controlled trials* for safety and effectiveness. This means comparing one group of volunteers' responses to a new drug with a different, matched group's responses to a placebo (the control group). To minimize bias, people in the test group and people in the placebo group do not know which substance they are receiving—that is, they are "blind." Furthermore, none of the scientists administering the test drug or the placebo knows what any of the volunteers are receiving—in other words, they also are "blind." Only the project manager knows who received what. The efficacy and safety of the test drug is determined by its performance compared to the placebo.

The placebo effect occurs in the treatment of many diseases, including ulcers, irritable bowel syndrome, colitis, chronic pain, headache, hay fever, asthma, depression, warts, and high blood pressure. The number of patients responding to placebos for almost any disease or symptom ranges from 30% to 70%; most placebo-controlled drug studies find that about half of all patients respond to placebos. This remarkable

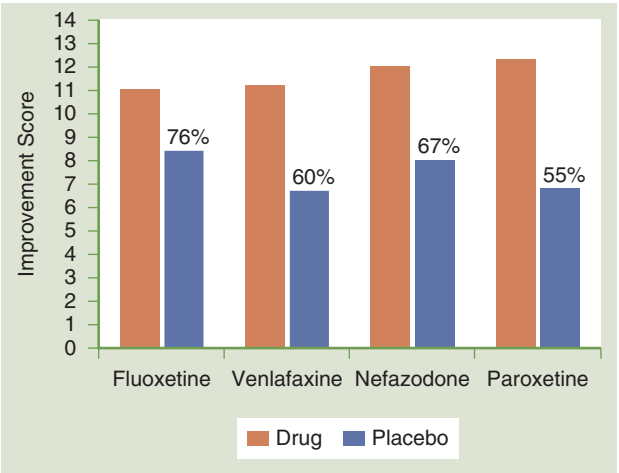

Figure 2.3 Comparison of Four Antidepressant Medications and Placebo in Improvement of Symptoms of Mild and Moderate Depression. The bars in the graph indicate the degree of improvement in symptoms of depression as determined by the Hamilton Depression Rating Scale (http://www.psy-world.com/hdrs.htm). In each instance, the placebo produces considerable improvement.

Data from Kirsch, I., et al. (2008). Initial severity and antidepressant benefits: A meta-analysis of data submitted to the Food and Drug Administration. *PLoS Medicine*, 5, e45. http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.0050045

finding means that you have a 50–50 chance of getting better simply by believing something will cure your ailment.

Depression is a condition in which the placebo effect can account for as much as 75% of any relief experienced. To determine how the placebo effect could be operating to relieve depression, researchers used a *positron emission tomography* (PET) scan to visualize the activity of different regions of the brain when depressed individuals received antidepressant medication or placebo (Mayberg et al., 2002). The results showed that the pattern of brain activity of patients receiving placebo was almost the same as those receiving antidepressant medications. Apparently, the expectation that their symptoms would improve caused biological changes in the brain that contributed to relief of depression (Kirsch et al., 2008). Figure 2.3 shows comparisons of the effectiveness of four antidepressant medications and placebos to reduce symptoms of mild to moderate depression. Note that in each instance the placebo is almost as effective as the medication. About 60% of patients respond to the placebo as do those receiving the drug. Because one major characteristic of depression is feeling hopeless and that things cannot improve, these results suggest that believing that one is receiving an antidepression medication triggers a sense of hope, which reduces symptoms of depression. Antidepressant drugs and placebos produce similar alterations in brain chemistry, principally elevations in the neurotransmitters serotonin and norepinephrine.

Why, if placebos are so effective in healing, are they not used more by physicians in treating patients? One reason is an ethical dilemma for physicians: A placebo might work for one patient but not for another. Although the same could be true for a prescribed drug, the physician is protected legally by prescribing a drug that has been clinically tested and approved by the FDA. However, no legal protection exists for a physician prescribing a placebo if the patient decides to sue, claiming that the treatment did not meet accepted medical standards.

Who knows what might work as a placebo? Perhaps consuming a couple of M&Ms twice a day can cure pain and many other symptoms. Often the safest and best path to relief of suffering is to engage the power of the mind.

The placebo effect can also act in reverse and cause pain, distress, or illness. This is called the **nocebo effect** (from the Latin "I shall harm"). Because words can produce a nocebo effect, it's wise to consult health practitioners whom you trust and who use positive, constructive healing suggestions and encourage becoming involved in self-healing practices. No one needs to hear negative suggestions such as "You'll probably have to take these pills for the rest of your life," or "I doubt that you'll be able to move around much after an accident like that." When being prescribed a medication, it's helpful for the health practitioner to say something like, "I'm optimistic that this medication is going to do the trick" instead of "This medication works OK, but not for everyone."

In the presence of a physician, many individuals become psychologically open to suggestions, both positive and negative, because their minds are intently focused on what the practitioner is saying. Such a focused state of mind is similar to that obtained in meditation or hypnosis. It is more helpful for people to be alert and critical when discussing health concerns or results from a medical test. This is not always easy to do, especially when the information being conveyed may cause distress or fear. It is probably wise to take some time to settle oneself before accepting totally what a health practitioner has said or *what one imagines* she or he has said.

A tragic but dramatic example of a nocebo effect involved a patient who died apparently from reading a single word (Hewlett, 1994). This person had a history of chronic lymphocytic leukemia, a form of blood cancer that usually is easily controlled with drugs. The patient had been well for more than 3 years with only intermittent need for medication. However, he had never actually been informed of the original diagnosis of his condition.

One day he was in his physician's office on a routine visit and happened to read the physician's notes, which were lying on the desk. He saw the word *leukemia* in his file. He missed his next scheduled office visit and shortly thereafter showed up in the hospital's emergency room. Within 3 weeks, he died in the hospital. No cause of death could be discovered at autopsy, and his leukemia was still in remission. The patient apparently believed that he had terminal cancer just from seeing the word *leukemia* in his medical records.

The Mind Can Create Illness or Wellness

That thoughts and feelings can alter physiological processes means that individuals have the power to influence their health for ill or for well-being. For thousands of years, belief in the healing powers of a deity

or special person such as a king, priest, or shaman or ascribing healing powers to a potion or elixir have been employed to heal the sick by ridding the body demons and evil spirits. Today's patients have faith in the knowledge of their physicians and the medicines they prescribe just as people of ancient civilizations believed in their priests and herbs. Any improvement in a patient's condition is likely a combination of faith in the healer and the efficacy of the treatment.

Ancient Egyptian papyri show that the priest physicians of ancient Egypt relied on the belief of the people in the healing power of the gods. Priests would put patients into a trance in a temple and tell them that when they awakened, they would be healed. And often they were. Greek and Roman healers also used trance and sleeplike mental states to impart healing suggestions to people who believed that their healers had divine powers. King Pyrrhus of Epirus is reputed to have cured sick individuals solely by the touch of his big toe.

> *Faith. You can do little with it and nothing without it.*
>
> **—Samuel Butler**

The New Testament recounts many examples of the healing power of Jesus:

> *Is any sick among you? Let him call for the Elders of the church and let them pray over him, anointing him with oil in the name of the Lord; and the prayer of faith shall save the sick.*
>
> **—James 5:14–15**
>
> *That evening they brought him many who were possessed with demons, and he cast out the spirits with a word, and healed all who were sick.*
>
> **—Matthew 8:14**
>
> *And he said to her, "Daughter, your faith has made you well; go in peace and be healed of your diseases."*
>
> **—Mark 5:34**

A personal relationship with the transcendent or sacred, either through religion or other spiritual beliefs and practice, can provide a powerful and meaningful way to cope with life-changing and traumatic experiences such as disease, aging, and death. During the COVID-19 global pandemic, many patients and their families, and healthcare workers turned to religious or spiritual practices to provide a compassionate presence, allay fears, promote strategies for managing stress, promoting recovery and resilience, and supporting hopes and dreams for a better future (Roman et al., 2020).

Many people use prayer to help them cope with illness. People pray for their own health and the health of others; they pray individually and in prayer groups. People pray to God, a "guardian angel," or a deceased loved one for support and personal strength to cope with illness. Because feelings of security and confidence are associated with religious experience, the social support offered by religious affiliation can enhanced immune function.

At times of serious illness or when death is a possibility, many individuals want their physicians to be aware of their spiritual or religious beliefs. On the other hand, for routine health matters most patients do not want their physicians to be directly involved in their health-related spiritual experiences. Most doctors believe that a patient's spiritual outlook is important to handling health difficulties and that physicians should ask patients about spiritual and religious issues, although few physicians believe that it is appropriate for health practitioners to recommend prayer and religious activities to patients.

The Mind Can Create Illness

Psychosomatic Illnesses

The power of the mind to cause illness is borne out by a long list of psychosomatic illnesses (**Figure 2.4**). These conditions are caused in large measure by mental states and attitudes such as persistent anxiety, depression, and stress that produce unhealthy physiological changes and induce self-destructive behaviors to cope with distress. That is why these illnesses are called **psychosomatic**, a term derived from the Greek (*psych*, mind; *soma*, body).

Many people believe that psychosomatic means imaginary, that "it's all in the head." This is not the case. The damage to the gastrointestinal tract in someone with stress-related bowel illness is just as real as the damage caused by an infection or injury. *Psychosomatic* means that thoughts and feelings are at the root of a physiological abnormalities that cause symptoms. For example, depression or anger may cause pain (especially low back pain), fatigue, nausea, diarrhea, and sexual problems.

A large percentage of visits to primary care physicians are estimated to be for psychosomatic symptoms. These symptoms are difficult and time-consuming for health practitioners to diagnose and treat, and they are expensive for the healthcare system. A common complaint is pain of long duration in several parts of the body that cannot be explained by any medical

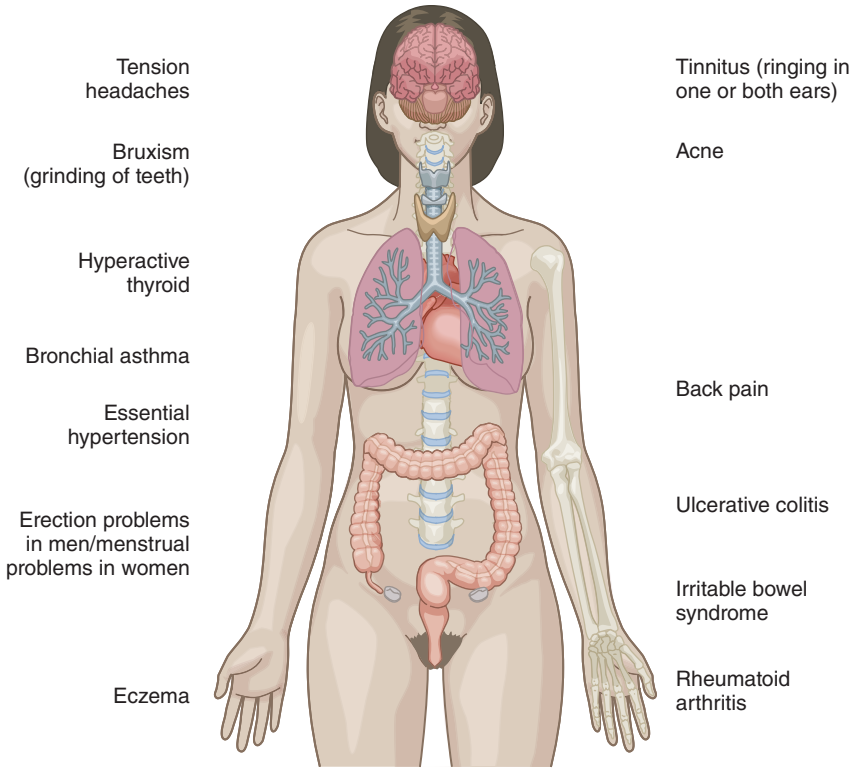

Figure 2.4 Psychosomatic Illnesses. Many diseases and disorders of the body are partly caused by thoughts and feelings.

condition or injury. Many health practitioners tend not to treat psychosomatic illnesses; they offer medications to suppress symptoms rather than invest time addressing the underlying mental states that cause an illness. This occurs in part from their training, which focuses primarily on biological causes of illness, and in part by not having time to probe the lifestyle of a patient with a psychosomatic illness; also, the patient's health insurer is not likely to pay for the doctor to do so.

Having to live in harsh financial, family, social, or environmental circumstances can disrupt mind–body harmony to the degree of producing pain and sickness. Health can be restored with knowledge of how the mind and body interact and the application of methods that produce insight to the particular issue. Compassionate professional help and guidance are also highly beneficial.

The Mind Can Create Wellness

The power of the mind to create wellness is illustrated by studies that show that positive emotions are associated with healthful biological changes. For example, a group of English civil service workers were asked to rate their state of happiness several times during a typical workday while researchers measured their blood pressure, heart rate, and stress hormone (cortisol) levels. Those with the highest happiness ratings showed the lowest heart rate and stress hormone levels (there was no effect of happiness on blood pressure).

The role of humor in maintaining health has a long history. Plato advocated humor as a means to lighten the burdens of the soul and to improve one's health. From medieval court jesters to modern circus clowns, laughter has been used to help people forget their

Take a time out to meditate whenever you need to.

problems, restore mind–body harmony, and foster health and healing. In 1979, Norman Cousins, a well-known magazine editor, described how he had cured himself of a rare untreatable disease (ankylosing spondylitis) by watching humorous movies for months until he had laughed himself well (Cousins, 1979). Scientific studies have confirmed that humor has a positive effect on the immune system by increasing levels of natural killer cells that help prevent infections (Bennett & Lengacher, 2009). Humor elevates pain thresholds by activating endorphins (hormones released in the brain) that affect pain responses. Humor reduces stress and anxiety in cancer patients, becoming a powerful adjunct to medicines in the healing process (Roaldsen, Sørlie, & Lorem, 2015). Laughter is healthy because it causes the release of two "feel good" chemicals in the brain—endorphin and dopamine—and decreases the production of cortisol, a stress hormone.

Resilience

As you undoubtedly know from your own experience, life has its gains and losses, ups and downs, good days and bad days, sickness and health, joys and sorrows, and victories and defeats. A life totally free of adversity is impossible. However, in the face of adversity, we can strive to live a life of meaning and satisfaction. We do this by cultivating **resilience**, which is defined as "the process of adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress, such as family and relationship problems, serious health problems, or workplace and financial stressors" (American Psychological Association, 2012). Not only is it "bouncing back" from difficult experiences, resilience also guides us to redirect future behavior in positive and healthy directions.

Resilience is not an inborn trait. It is a quality of mind that can be developed. You might know of someone who experienced a significant setback; worked through it with patience, self-compassion, support of family, friends, and community, and perhaps professional guidance; and set themselves on a life path toward greater stability, happiness, self-acceptance, and satisfaction. Here are some ways to build resilience (American Psychological Association, 2012):

- Cultivate supportive social relationships with empathic, understanding, accepting, trustworthy, and compassionate individuals. Avoid isolation. If reticent, force yourself to accept others' offers of help.
- Take care of your body with proper nutrition, adequate hydration, sufficient sleep, and regular exercise. Don't sit and worry, *move*!
- Take care of your mind with journaling, art, music, yoga, prayer, or meditation.
- Avoid using alcohol or drugs to cope with negativity, distress, and emotional pain.
- Find purpose by giving goodness to others through volunteering with civic, faith-based, or other organizations.
- Make molehills out of mountains. Accept problems as the way of things. Solve big problems by breaking them into manageable parts. Apply what you've learned from overcoming prior problems.
- Establish realistic goals and move toward them a step at a time. Ask yourself, "What one thing can I accomplish today that helps me move in the direction I want to go?"
- Focus on the good. Find opportunities in setbacks for personal and interpersonal growth.
- Be supportive of your efforts and strengths; ignore self-criticism and self-doubts of your worth. Be appreciative of the goodness that others bestow on you; ignore (don't engage) others' negativity.
- Keep things in perspective. Resist catastrophizing difficulties or assuming the world is against you. When overwhelmed, remind yourself that you're not helpless, "tomorrow is another day," and that you may be stressed out but you are still OK.
- Let go. Acknowledge that change is a part of life and certain goals or ideals may no longer be applicable to your current life or goals for the future.
- Be optimistic even when life isn't going your way. Visualize what you want rather than ruminate over what you've lost or any fears of the unknown.
- Get help to get unstuck from making progress in life or when you're unable to function as usual.
- Appreciate that you are not alone. Everyone is on a journey through life.
- Remember: There are many things in life over which you have little or no control. The one thing you can control, however, is yourself. And that's hard enough!

Ways to Promote Mind–Body Harmony and Health

Autogenic Training

Autogenic training uses autosuggestion—adopting ideas that you give yourself—to establish a balance between the mind and body through changes

in the autonomic nervous system. The method has been shown to be effective in relieving anxiety (Miu, Heilman, & Miclea, 2009) and improving the quality of life in people with chronic medical conditions (Sutherland, Andersen, & Morris, 2005).

Autogenic training involves learning to concentrate on one of six basic autogenic phrases for a few minutes each day over a week or more. After weeks or months of practice, one is able to attain a deep sense of relaxation, often within seconds, which can result in healthful physiological changes. The six basic autosuggestions are as follows:

1. My arms and legs are heavy.
2. My arms and legs are warm.
3. My heartbeat is calm and regular.
4. My lungs breathe for me.
5. My abdomen is warm.
6. My forehead is cool.

The exact phrasing of any autogenic suggestion is not critical to its effectiveness. The words carry no particular power. Any suggestion can be rephrased so that it becomes comfortable, believable, and acceptable to the practitioner's mind.

A long-practiced type of autogenic training is **lovingkindness meditation (LKM)**, or *metta*. This practice involves reciting positive phrases toward oneself or another. The purpose of metta is to strengthen neurological connections in the part of the brain responsible for giving and receiving supportive emotional interpersonal connections, the so-called friend and befriend region. LKM can be done at any time. Because the practice induces mind–body relaxation, many people find it beneficial when going to sleep. Here are steps for LKM:

1. Be in a quiet, restful, nondistracting locale.
2. Take two or three calming breaths (see the Wellness Guide "Self-Care: The Calming Breath" in Chapter 9) to deactivate the sympathetic nervous system and activate the parasympathetic nervous system.
3. Focus your attention on your heart region—perhaps place a hand on your heart—and say aloud or silently these phrases: "May I feel safe from inner and outer dangers." "May I feel content." "May I feel strong." "May I live with ease." You can choose other phrases that might feel more suitable, such as "May I be safe, peaceful, and free of suffering." "May I be happy." "May I be healthy." As you recite the phrases, try to feel the emotion of caring—wholeheartedly wishing these states of well-being on yourself or someone else.

Biofeedback

Biofeedback consists of methods for using the mind to alter bodily functions. This method employs a recording device to facilitate learned self-control of physiological activities (see the Managing Stress box "Biofeedback"). The recording device is connected to a region of the body (e.g., forehead, arm), and information about biological activity in that region is "fed back" on a screen or by means of a sound to the person in whose body the activity is taking place. Using this visual or auditory information about the activity, the person can learn to control the activity in a desired way. Biofeedback has been used successfully to treat more than 150 medical conditions, including high blood pressure, back pain, panic attacks, asthma, and headaches (Mayo Clinic, 2021). Biofeedback also can be used to produce changes in the brain's electrical activity (alpha waves) to bring about a state of relaxation. Biofeedback involving only the brain's electrical activity is called *neurofeedback*.

Hypnosis and Healing

Hypnosis (from the Greek *hypnos*, meaning sleep) is a state of concentration and focused attention. The method typically involves attaining a relaxed mental state in which suggestions for imaginative experiences are presented by another person. This is called the *hypnotic induction*. Hypnotic suggestions can alter perception, sensation, emotion, thought, or behavior and, in this way, the mind can be focused on health issues. **Hypnotherapy** is the use of hypnosis to reduce pain, facilitate childbirth, decrease anxieties, manage body weight, and stop smoking.

> *We do not see things as they are. . . . We see things as we are.*
>
> **—Talmud**

To be successful therapeutically, hypnosis requires that (1) the participants are identified as the hypnotist and the client; (2) suggestions are a key to the procedure; (3) the client consents to participating in the procedure, especially to receiving and accepting suggestions; and (4) the therapist describes the technique beforehand and how it is supposed to help (Montgomery, Schnur, & Kravits, 2013). Success in hypnosis is greatly influenced by the rapport between client and hypnotherapist and the degree of

Biofeedback

Dan was a first-year graduate student who experienced frequent headaches, for which he sought help from the Student Health Center. Medical tests showed no brain pathology such as a tumor, or brain infection or injury. Diagnosis: Dan's headaches were related to his stress and anxiety about doing well in graduate school.

Dan's therapy involved meeting with a counselor to discuss ways to manage the stress of graduate school and biofeedback training to deal specifically with his headaches. In biofeedback sessions, three small sensing devices, which monitored the activity of the forehead's frontalis muscle, were attached to Dan's forehead (**Figure 2.5**). The frontalis and certain muscles in the neck involuntarily contract during times of stress, which impedes blood flow to the head, resulting in a headache. Wires from the three sensors were connected to a biofeedback unit, which was placed on a table directly in Dan's view. Whenever Dan's frontalis muscle contracted, the biofeedback unit produced audible clicks. A highly tense frontalis produced rapid clicks. A relaxed frontalis produced infrequent, irregular clicks.

Dan was instructed by his biofeedback therapist to try to reduce the number of clicks, a skill that required several training sessions to attain. Paradoxically, not trying to relax his frontalis produced the best results. The therapy proved successful. Dan seldom got headaches. When he did, he could relieve them by relaxing the muscles in his forehead.

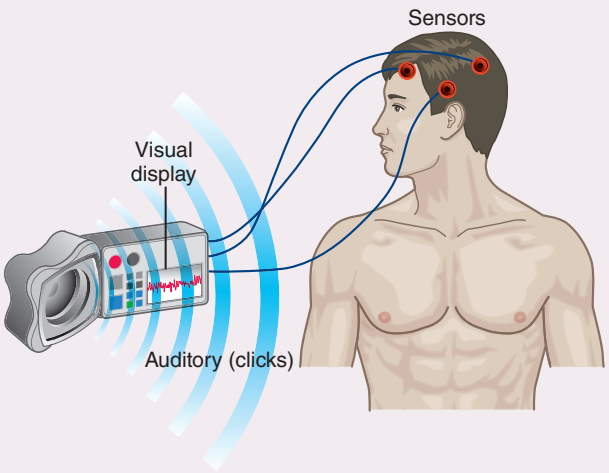

Figure 2.5 Biofeedback. The biofeedback device measures muscle tension in the head region. The speaker produces rapid audible clicks when muscles are tense and infrequent and irregular clicks when head muscles are relaxed.

the client's mental relaxation. This permits the mind to be open to suggestion rather than involved in a variety of thoughts.

Many people have misapprehensions about being hypnotized, and many myths about hypnosis still exist. Perhaps the greatest fear people have is being induced to do something embarrassing, immoral, illegal, or evil when they are hypnotized. Some of the misconceptions and apprehensions about hypnosis are summarized in **Table 2.2**.

Table 2.2 Myths About What Happens During Hypnosis

Myth: While under hypnosis you lose control of your mind and the hypnotist can make you do anything that he or she wants.

Fact: Despite what is portrayed in movies, a hypnotist cannot control your mind or make you do something against your will or beliefs. A hypnotized person can decide to become "unhypnotized" at any time. Ultimately, all hypnosis is self-hypnosis. The stage hypnotist selects people from the audience who want to be hypnotized and be part of the act. People do funny things on the stage because they agree in their minds that it is OK to do them. Similarly, a person follows a therapist's suggestions because of trust and a desire to be helped. No one can control your mind if you do not agree to cooperate.

Myth: Hypnosis is like falling asleep. You become unconscious and are unaware of what is happening around you. When you wake up you do not remember what was going on around you while you were hypnotized.

Fact: In hypnosis you do not lose consciousness, and most hypnotized subjects report that they feel fully aware. Hypnosis is like focused attention in which you are aware of specific thoughts to the exclusion of others. Just as with deep meditation, you are always in touch with reality and choose either to remain in the meditative state or "wake up."

Myth: Hypnotists have special psychic or occult powers, which explains why they can control other people's minds.

Fact: Hypnotists have trained their powers of observation and are skillful at giving suggestions. Those who claim to have special powers should be avoided because they harbor hidden motives and should not be trusted. Always remember that all hypnosis is self-hypnosis.

Myth: Only people with "weak minds" or of low intelligence can be hypnotized.

Fact: Everyone can be hypnotized, although people vary in that ability as they do in all abilities. Consider what happens in a movie theater. People laugh, cry, or are terrified by what is happening on the screen. But the images that affect them so powerfully are, in reality, light on the screen. Most moviegoers are in a state of hypnosis and, by adopting the role of "moviegoer," have agreed to allow their emotions to be manipulated by the images. Nevertheless, everyone is in control of their minds. Witness the sudden "unhypnotizing" if someone yells "Fire!" or if the lights are turned on abruptly. Again, it is worth emphasizing that all hypnosis is self-hypnosis.

Myth: Hypnosis is not useful or effective in improving health or harmful behaviors.

Fact: Hypnosis, or *hypnotherapy* as it is called when used by trained health professionals, may be especially useful in treating a wide range of symptoms. In 1957, the American Medical Association approved hypnotherapy as a valid therapeutic technique. Many physicians and clinical psychologists use hypnotherapy to treat a wide range of physical, emotional, and behavioral problems such as pain, panic attacks, smoking, alcoholism, and posttraumatic stress disorder.

Focusing Attention for Mind–Body Harmony

A wise teacher said that you could read thousands of books about focusing the mind, but none is as good as a demonstration. So, do this: Right now, notice the sensation of the bottoms of your feet touching the insides of the bottoms of your shoes. That sensation is caused by the nerves in the bottoms of your feet signaling your brain that your feet are touching your shoes. That signaling has been going on the entire time you've been reading this page, but you were unlikely to have noticed because your attention was focused on what you were reading—or perhaps on other thoughts— until you were asked to change the focus of your attention to the bottoms of your feet. This shows that you can choose to focus your attention (also called your *conscious awareness*) on what you want to: your feet, signals of discomfort from your body, worries, your to-do list, or memories of a nice time you had with someone special. Many mind–body methods involve becoming aware of what your mind is doing on a moment-to-moment basis and shifting the focus of your awareness from worry or busy mind to your breathing, a repeating sound or prayer, or an image. Instead of your mind being pushed and pulled this way and that by the busyness of your life, focusing your awareness on something calming or beautiful allows you to notice that your mind is overly busy—perhaps distressingly so—and to shift your mental process to something that facilitates feeling stable, in control, flexible, and adaptive.

Meditation

Meditation is a long-standing practice of focused awareness, trance induction, and relaxation. Contrary to what some people think, meditation is not a cult, a religion, or giving up control over one's mind. Neither is it being "zoned out" without thoughts or to escape reality. Instead, meditation is focusing on, paying attention to, and noticing what your mind is doing in the present moment without judging what you notice as "good" or "bad." Just notice. If you examine what is going on in your mind at any given moment, you will probably find it flitting from one thought to another, which is called *chatter*: "Did I remember to turn off the lights before I left the house?" "My feet are killing me; I shouldn't have worn these shoes." "I wonder what will be on the math test?" Most of the time the human mind is active and often involved in worrying or thinking about emotional upsets, financial concerns, or the tasks and pressures of daily activities.

Quieting the mind is healthy, and meditation is a way to accomplish that through focused awareness (see the Managing Stress box "Focusing Attention for Mind–Body Harmony"). Various meditation practices can achieve mindfulness. For example, Zen meditation (*zazen*) involves sitting still with legs crossed while trying to empty the mind of its chatter. Transcendental meditation teaches focusing on a particular phrase (called a **mantra**) that is repeated internally; focusing the mind's attention on a single phrase excludes other random thoughts. Insight or mindfulness meditation (*Vipassana*) teaches one to observe the flow of thoughts that pass through the mind without focusing on any particular one. It's also possible to meditate by focusing attention on a piece of art called a **mandala** or an object such as a flower, an image that has colors and patterns but no specific content, or a body movement (walking or sweeping meditation) (see **Figure 2.6**). Prayer is a form of meditation that focuses awareness on God. Meditation is something that nearly everyone

Figure 2.6 Mandala. A mandala is a complex visual image used to focus attention and facilitate meditation. ("Green Tara" an original painting by Maile Yawata)

Courtesy of Gordon Edlin

has experienced even if they have not called it meditation.

Meditation does not have to be done in a religious setting, nor is it complicated (see the Wellness Guide "Self-Care: Mindfulness Mediation for Lifelong Well-Being"). Most meditation practices focus attention on breathing—something you always have with you—and its various patterns can be the subject of focus. Is it slow and deep? Is it quick and shallow? Is it through one nostril or both?

As the meditator focuses awareness on breathing, the mind is highly likely to wander to various thoughts that stream by. Noticing that the mind is wandering, the meditator simply notes, "My mind is wandering," and refocuses awareness on the breath. Novice meditators can count the breaths from 1 to 10 to help focus (counting is similar to a mantra). After some time, it is highly likely the mind will wander again. Noticing this, one doesn't become frustrated or angry with oneself ("This isn't working!" "I'm a bad meditator"). The mind's job is to think, and wandering to thoughts in meditation demonstrates that. Meditation often comprises repeated cycles of focus and wandering (loss of focus). With some practice, it becomes easier to focus on breathing and letting thoughts stream in the background of the mind without paying much attention to them. Doing so engenders a calm state of being.

Self-Care: Mindfulness Meditation for Lifelong Well-Being

Follow the directions below to learn how to practice mindfulness meditation. Online and mobile app training programs are listed below.

Directions

Become comfortable: Find a quiet place where you can sit in a chair. Sit straight, uncross your legs, and place your feet flat on the floor. Rest your hands in your lap or let them go where they want to go. Take two easy, deep breaths, then breathe easily and naturally. Bring your shoulders down from your ears.

Step 1. Focusing on the feet: Close your eyes for 10 seconds and focus your awareness on the sensation of the bottoms of your feet touching the insoles of your shoes or the floor. After you open your eyes, note what your mind was doing while your eyes were closed.

Step 2. Focusing on the back: Close your eyes for 10 seconds and focus your awareness on the sensation of your back touching the chair. After a few seconds with your eyes closed, open your eyes, take an easy breath, and note what your mind was doing while your eyes were closed.

Step 3. Focusing on the breath: Close your eyes for 10 seconds and notice your breathing. Don't change your breathing rhythm or pattern, just notice the breath going in and out of your body.

You now know three basic meditation postures: (1) feet on the floor, (2) back against the chair, and (3) focus on the breath. With a bit of practice, you will discover which posture is best for you.

Step 4. Focusing for 30 seconds, and then 90 seconds: Become comfortable (see above). Choose one of the three meditation postures. Close your eyes and meditate by focusing your awareness for 30 seconds on your feet, back, or breathing (set your timer). While you're meditating, if you notice your mind wandering to this and that thought, refocus your awareness on your feet, back, or breathing. When the 30 seconds has elapsed, open your eyes and take a breath.

What did you notice while you were meditating? Did you hear sounds? Did your mind wander? Did you think about your to-do list? Did you tell yourself this was silly? Did you feel sleepy? Did you relax? All of these reactions are common. Whenever you meditate, you can expect your mind to wander and to think. When you notice that it does, just notice, and refocus your awareness on your feet,