



PART I

Overview of the Public Health Nutrition Landscape

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CHAPTER 1

Community Nutrition and Public Health

CHAPTER OUTLINE

- Introduction
- The Concept of Community
- Public Health and Nutrition
- The Relationship Between Eating Behaviors and Chronic Diseases
- Reducing Risk Through Prevention
- Levels of Prevention
- Health Promotion
- Public and Community Health Objectives
- Canadian Health Promotion Objectives
- Historical U.S. National Health Objectives
- Healthy People in Healthy Communities
- Knowledge and Skills of Public Health and Community Nutritionists
- Places of Employment for Public Health and Community Nutritionists
- Ethics and Community Nutrition Professionals
- Preventive Nutrition
- Nutrition Care Process: Evidence-Based Practice
- The Cooperative Extension System

LEARNING OBJECTIVES

- Define public health and community nutrition.
- Discuss the relationship between diet and diseases.
- List current nutrition- and diet-related public health problems.
- Explain primary, secondary, and tertiary prevention.
- Outline the educational requirements, practice settings, roles, and responsibilities of community and public health nutritionists.

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LEARNING OBJECTIVES

(continued)

- Define the terms *Registered Dietitian (RD)* and *public health nutrition*.
- Discuss the role of Healthy People Objectives in health promotion and disease prevention.
- Explain the importance of the Academy of Nutrition and Dietetics Code of Ethics.
- Discuss the different steps of the Nutrition Care Process of the Academy of Nutrition and Dietetics.

► Introduction

Community nutrition is a modern and comprehensive profession that includes, but is not limited to, public health nutrition, dietetics and nutrition education, and medical nutrition therapy.¹ Community nutrition aims to improve the health of those people within a defined community. It deals with a variety of food and nutrition issues related to individuals, families, groups within the community, and special groups who have a common link such as place of residence, language, culture, or health issues.² An example of a successful community nutrition program using a special group was conducted in the city of Baltimore and six Maryland counties simultaneously. Over 2-year period, a multifaceted intervention program was carried out at 16 Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) sites to increase fruit and vegetable consumption among the women. After 1 year of this intervention program² the amount of fruits and vegetable consumed increased. Changes in consumption were related to the number of nutrition sessions the participants attended.² There is an increasing need to focus on community in **health promotion** and disease prevention because behavior is highly influenced by the environment in which people live. Local values, norms, and behavior patterns have a significant effect on shaping an individual's attitudes and behaviors.^{3,4} The increasing movement toward using a community approach requires community **nutritionists** to become more visible and vocal leaders of community health. However, before community nutritionists can participate in nutrition and healthcare planning, they must be knowledgeable about the concept of community as a client.

► The Concept of Community

The concept of **community** varies widely. The World Health Organization (WHO) defines community as “a social group determined by geographic boundaries and/or common values and interests.”⁵ Community members know and interact with one another; function within a particular social structure; and show and create norms, values, and social institutions.⁶ Suburbs and other areas

surrounding the legal limits of a city are also an integral part of that city's total community.⁷

A second definition of community is demographic and involves viewing the community as a subgroup of the population, such as people of a particular age, gender, social class, or race.⁸ A community also can be defined on the basis of a common interest or goal. A collection of people, even if they are scattered geographically, can have a common interest that binds its members. This is called a common-interest community.⁹ Many successful prevention and health promotion efforts, including improved services and increased community awareness of specific problems, have resulted from the work of common-interest communities. The following are some examples of common-interest communities⁹:

- Members of a national professional organization (e.g., Academy of Nutrition and Dietetics (formerly known as American Dietetic Association), American Medical Association, Federation of American Societies for Experimental Biology, African American Career Women, National Association of Asian American Professionals, American Public Health Association)
- Members of churches
- Disabled individuals scattered throughout a large city
- Individuals with a specific health condition (e.g., diabetes, hypertension, breast cancer, and mental illness)
- Teenage mothers
- Homebound elderly persons

Community nutrition and dietetics professionals are also members of a community and are public health agency professionals who provide nutrition services that emphasize community health promotion and disease prevention. They deal with the needs of individuals through primary, secondary, and tertiary preventions (which will be discussed in detail later in this chapter).

- **Primary prevention** involves designing activities to prevent a problem or disease before it occurs.
- **Secondary prevention** involves planning activities related to early diagnosis and treatment, including screening for diseases.

- **Tertiary prevention** consists of designing activities to treat a disease state or injury and prevent it from progressing further.¹⁰

Community nutrition and dietetics professionals establish links with other professionals involved in a wide range of education and human services, such as childcare agencies, social work agencies, services for older persons, high schools, colleges and universities, homeless shelters, and community-based epidemiologic research.

► Public Health and Nutrition

Public health is defined as “the science and art of preventing disease, prolonging life, and promoting health and efficiency through organized community efforts, so organizing these benefits as to enable every citizen to realize his/her birthright of health and longevity.”¹¹ It has been viewed as the scientific diagnosis and treatment of the community. In this vision, the community, instead of the individual, is seen as the patient. When the focus is on the community, patterns and processes begin to emerge and combine to form a unified whole.¹² Using this approach avoids focusing on risks and diseases; instead, the focus is on the community’s strengths and resilience. Community strengths can be physiological, psychological, social, or spiritual. They include such factors as education, coping skills, support systems, knowledge, communication skills, nutrition, coherent belief systems, fitness, ability to develop a supportive environment, and self-care skills.³

Community nutritionists can utilize any of the community strengths to increase the nutrition knowledge of the community members, which can subsequently reduce medical care costs and improve quality of life.¹³⁻¹⁶ The negative consequences of nutrition-related problems include malnutrition and chronic health conditions such as obesity, cardiovascular disease, cancer, and diabetes mellitus.^{17,18} In addition, these conditions contribute significantly to the world’s burden of morbidity, incapacity, and mortality, despite the tremendous amount of biological knowledge accumulated over the years.¹⁸ The WHO estimated that prevention of the major nutrition-related risk factors (high fat, sodium, and sugar intake; cigarette smoking; inactivity; poor dietary behavior; and alcohol abuse) could translate into a gain of 5 years of disability-free life expectancy.^{19,20}

A community and **public health nutrition** approach will make it possible to reverse the course of major nutrition problems.^{21,22} Dietetics professionals can take the lead in prevention programming because their training as counselors and educators provides

skills that make them important members of the public health profession.

Public health nutrition was developed in the United States in response to societal events and changes to the following situations^{1,23,24}:

- Infant mortality
- Access to healthcare
- Epidemics of communicable disease
- Poor hygiene and sanitation
- Malnutrition
- Agriculture and changes in food production
- Economic depression, wars, and civil rights issues
- Aging of the population
- Behavior-related problems or lifestyle (poor dietary practices, alcohol abuse, inactivity, and cigarette smoking)
- Chronic diseases (obesity, heart disease, diabetes mellitus, mental health, cancer, osteoporosis, and hypertension)
- Poverty and immigration
- Preschool and after-school childcare and school-based meals
- Ebola virus
- Zika virus

► The Relationship Between Eating Behaviors and Chronic Diseases

As evidenced by an introductory review of the literature and research in the area of eating behavior and chronic disease, the relationship between eating behaviors and chronic diseases is significant and affects individuals and communities greatly.²⁵ **TABLE 1-1** shows dietary factors linked to some of the most common chronic diseases. It is important to note that dietary factors overlap with multiple problems and are applicable to many of the health conditions listed.

The *Surgeon General’s Report on Nutrition and Health*, government agencies, and nonprofit health and scientific organizations have provided comprehensive analyses of the relationships among diet, lifestyle, and major chronic diseases.²⁶⁻²⁸ Health conditions such as coronary heart disease, stroke, cancer, and diabetes are still the leading causes of death and disability in the United States and globally, and changes in current dietary practices could produce substantial health gains.

There have been concerns about the eating patterns of the U.S. population since the 1980s. Health policy makers have linked several dietary-related factors to chronic diseases, such as heart disease, cancer, birth defects, and osteoporosis, among the U.S. population

TABLE 1-1 Some Possible Health Problems Linked with Dietary Habits									
Beneficial Behavior	Risk for Heart Disease	Risk for Some Cancers	Risk for Diabetes	Risk for Obesity	Risk for Osteoporosis	Risk for Birth Defects	Risk for High Blood Pressure	Risk for Anemia	
Eat foods lower in total fat, saturated fat, and cholesterol	✓	✓	✓	✓			✓		
Eat foods lower in calories; balance caloric intake with physical activity	✓	✓	✓	✓			✓		
Drink alcohol in moderation	✓	✓							
Eat less cured and smoked foods		✓							
Prepare foods with less salt	✓						✓		
Eat foods high in calcium and vitamin D	✓				✓		✓		
Eat foods high in iron								✓	
Eat foods high in folic acid	✓	✓				✓		✓	
Eat foods high in antioxidants	✓	✓	✓		✓	✓			
Eat foods high in soluble and insoluble fiber	✓	✓	✓	✓		✓	✓	✓	
Eat foods high in omega-3 fatty acids	✓	✓	✓			✓			
Breastfeed infants		✓	✓						

and that of other industrialized countries.^{25,29} This link between diet and disease has led to the publication of guidelines to promote healthier eating habits. The National Academy of Sciences, the U.S. Department of Health and Human Services, and the U.S. Surgeon General have published the majority of these guidelines, which are discussed later in this chapter.^{11,12,30,31}

In addition to dietary intake, many other factors contribute to chronic diseases, such as genetic factors and lifestyle factors (e.g., cigarette smoking).³¹ Medical geneticists working on the Human Genome Project, a major international initiative to decipher the 3-billion-unit code of DNA in the 80,000 to 100,000 genes found in humans, have already identified genes associated with many chronic diseases, such as breast, colon, and prostate cancers; severe obesity; and diabetes.^{32–35}

Programs to promote health and longevity start with examining the major causes of death and disability. The top causes of death according to the National Center for Health Statistics and Global Statistics and the WHO's 2012 and 2015 data are presented in **BOXES 1-1** and **1-2**.^{36,37}

The public health approach to prevention understands that the reduction of risk for individuals with average risk profiles might be small or negligible. However,



Public speaking is a great way to pass along nutrition information.

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BOX 1-1 The 10 Leading Causes of Death in the United States

1. Heart disease
2. Cancer
3. Chronic lower respiratory tract disease
4. Accidents (unintentional injuries)
5. Stroke (cerebrovascular disease)
6. Alzheimer's disease
7. Diabetes
8. Influenza and pneumonia
9. Nephritis, nephrotic syndrome, and nephrosis
10. Intentional self-harm (suicide)

Reproduced from: National Center for Health Statistics. Leading causes of death. <http://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm>. Accessed March 2, 2016.

BOX 1-2 The 10 Leading Causes of Death Worldwide

1. Ischemic heart disease
2. Cerebrovascular disease
3. Acute lower respiratory tract infections
4. HIV and AIDS
5. Chronic obstructive pulmonary disease
6. Diarrheal diseases
7. Tuberculosis
8. Malaria
9. Cancer of the trachea, bronchus, or lung
10. Road traffic accidents

Data from: World Health Organization (WHO). The top 10 causes of death. <http://www.who.int/mediacentre/factsheets/fs310/en/index.html>. Accessed March 2, 2016.

high-risk persons need special attention through primary, secondary, and tertiary preventions. Although it may not eliminate a disease for people who are genetically inclined to it, good primary prevention strategies could reduce the severity of the disease.³⁸

► Reducing Risk Through Prevention

Prevention is important in public health as well as community nutrition practice. The three important parts of prevention are personal, community-based, and systems-based.⁶ Each part has a different role and focus. Establishing an overall effective community nutrition practice involves correctly using and combining each part.

Personal prevention involves people at the individual level—for instance, educating and supporting a breastfeeding mother to promote the health of her infant.

Community-based prevention targets groups—for example, public campaigns for low-fat diets to decrease the incidences of obesity and heart disease.^{39,40}

Systems-based prevention deals with changing policies and laws to achieve the objectives of prevention practice, such as laws regarding childhood immunization, food labels, food safety, and sanitation.

One part of systems-based prevention deals with socioeconomic status, which affects health through environmental or behavioral factors. The socioeconomic model hypothesizes that poor families do not have the economic, social, or community resources needed to be in good health. For instance, poverty affects children's well-being by influencing health and nutrition, the home environment, and neighborhood conditions.^{41,42} The combined effects of poverty provide the foundation for a cycle of poverty and hopelessness among family members, who in turn engage in risky health behaviors, such as substance abuse, smoking, and poor dietary habits, that can result in obesity and nutrition-related chronic diseases.

Socioeconomic models have been used to develop policies and disease prevention strategies, such as the Mackenbach model, that can be used as a basis for developing policies and intervention strategies. **FIGURE 1-1** presents the link between socioeconomic status and health-related problems triggered and maintained by two processes (selective and causative) that are active during different periods of life.⁴³ The selective process is represented by childhood health, which determines adult health as well as socioeconomic position. The

causative process represents three groups of risk factors (lifestyle, structural or environmental, and psychosocial stress-related factors), which are intermediaries between socioeconomic position and health problems. The model also acknowledges that childhood environment and cultural and psychological factors contribute to inequalities in health through both selection and causation. Health inequalities become self-perpetuating through a cycle of inadequate childhood health, adult socioeconomic position, and incidence of health problems at adult ages.⁴³

► Levels of Prevention

Each part of prevention itself has three levels. *Primary prevention* is an early intervention focused on controlling risk factors or preventing diseases before they happen, thus reducing their incidence. Examples of primary prevention include fortifying milk with vitamin D to prevent rickets in children, fortifying infant formula with iron to prevent anemia, and fluoridating public water supplies to prevent dental decay. *Secondary prevention* includes identifying disease early (before clinical signs and symptoms manifest) through screening. Timely intervention is provided to deter the disease process and prevent disability that may be caused by the disease. For instance, providing **nutrition education** on the importance of reducing dietary cholesterol, saturated fat, and caloric intake and increasing dietary fiber to individuals with high blood cholesterol is a secondary

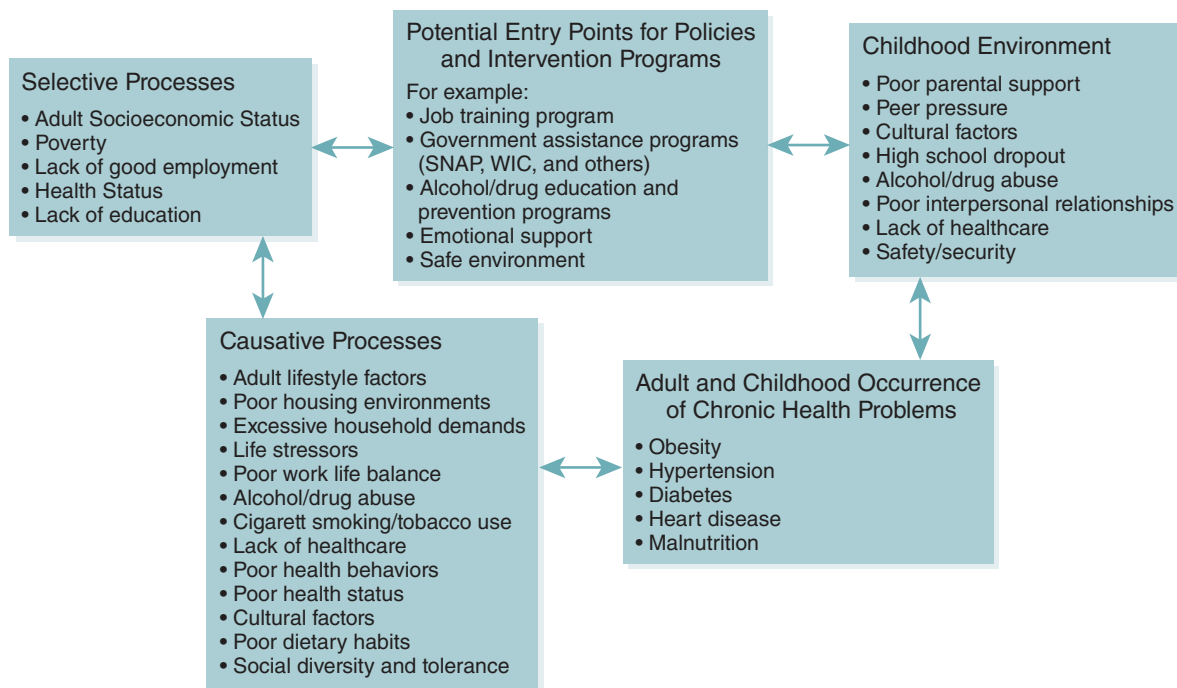


FIGURE 1-1 Selective and causative factors involved in the development of health inequalities in society.

Modified from: Mackenbach J, Bakker M. *Reducing inequalities in health: A European perspective*. London: Routledge; 2002:18.

intervention to prevent the complications of heart disease.^{15,44–46} *Tertiary prevention* is intervention to reduce the severity of diagnosed health conditions to prevent or delay disability and death. For example, providing education programs for persons recently diagnosed with hypertension is an intervention to prevent disability and additional health problems.⁴⁷ **FIGURE 1-2** presents the three levels of prevention and intervention approaches.

FIGURE 1-3 shows that a natural progression of a disease starts at the induction or initiation period. It

also shows the relationship between disease progression and level of intervention. Early intervention (primary prevention) can reduce disease progression in its early stages. For example, for bacterial infections (such as *Escherichia coli*), the incubation period is an early stage of disease development in which individuals are not yet feeling the infection’s effects. Also, an intervention such as a structured daily physical activity can slow weight gain and prevent obesity. Latency or dormancy is a similar early period when a disease (e.g., cardiovascular

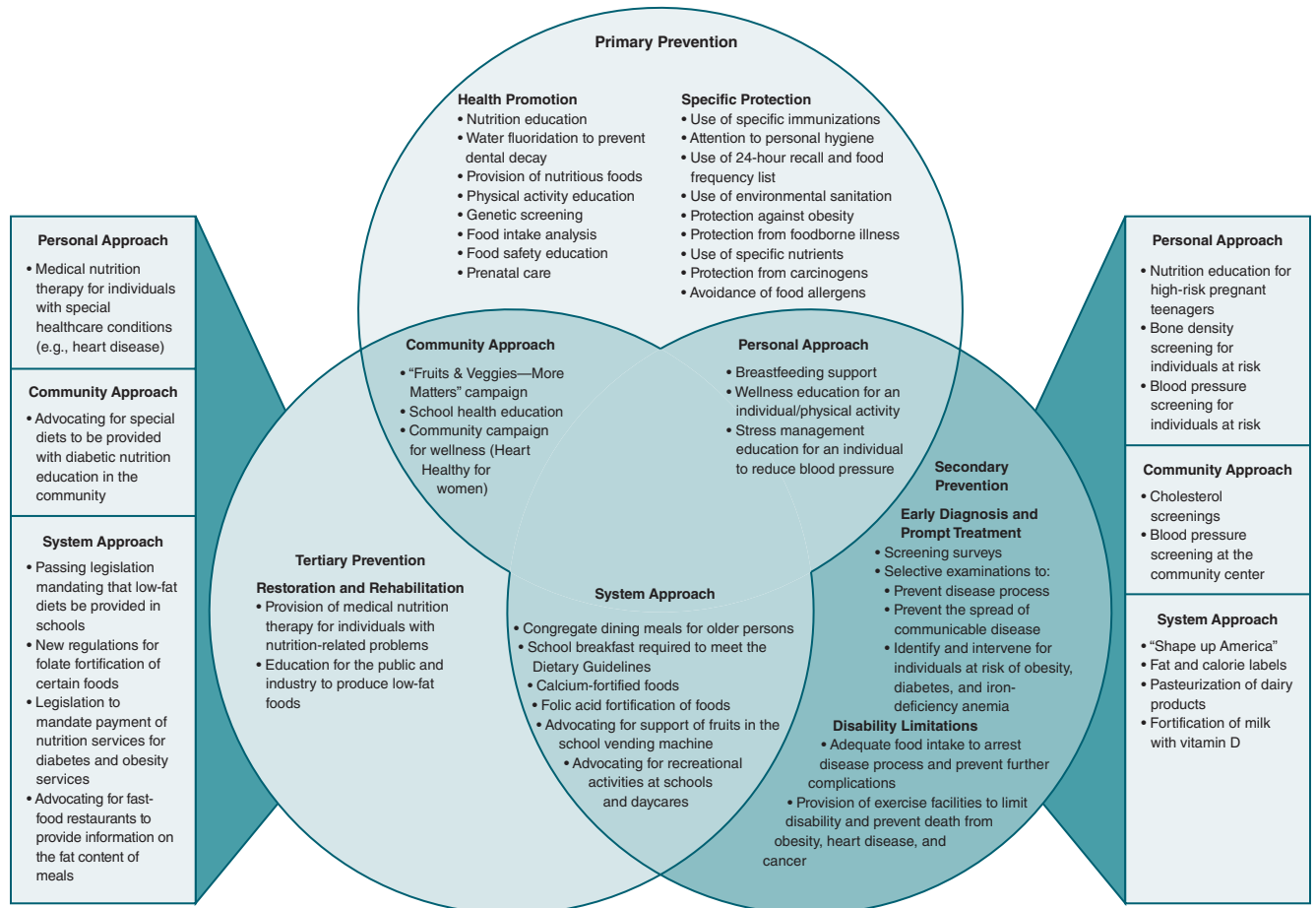


FIGURE 1-2 The three levels of prevention and intervention approaches.

Adapted from: Mandle CL. *Health Promotion Throughout the Lifespan*. 5th ed. St. Louis, MO: Mosby; 2002. Public Health Nutrition Practice Group, 1995; and Owen AL, Splet PL, Owen GM. *Nutrition in the Community*. 4th ed. New York, NY: McGraw-Hill; 1999.

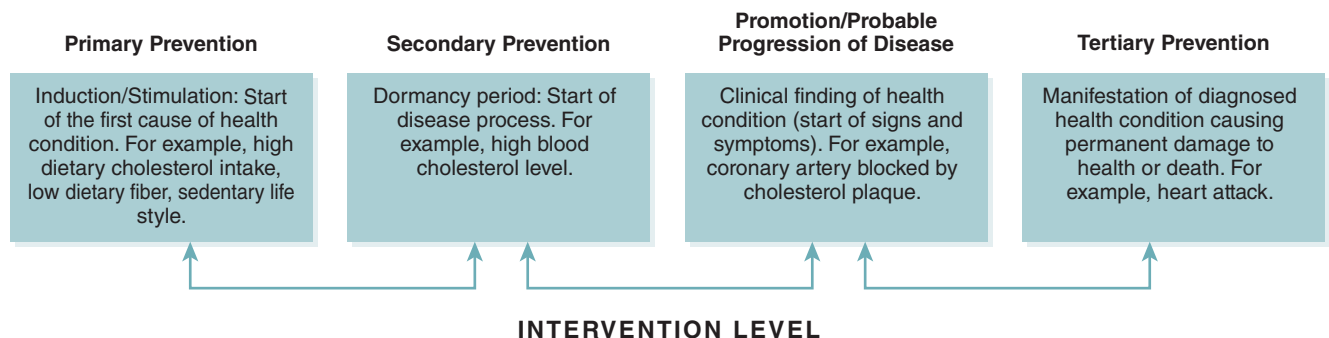


FIGURE 1-3 Levels of epidemiologic research: a conceptual elaboration.

Modified from: Kleinbaum DG, Kupper LL. *Epidemiologic Research: Principles and Quantitative Methods Solution Manual*. New York, NY: Van Nostrand Reinhold. Reprinted with permission of John Wiley & Sons; 1982:22.

disease) has the potential of being expressed. Secondary prevention, such as blood pressure screening, will detect clinical symptoms and can help prevent the progression of a disease. The expression period is when the disease has occurred. At this point an intervention (tertiary prevention) is provided to reduce the severity of the disease or prevent death; for example, a person could reduce dietary fat intake to manage heart disease.¹

► Health Promotion

Health promotion is another major concept important to community and public health nutrition. Health promotion can be defined as the process of enabling people to increase control over the determinants of good health and subsequently improve their health.²⁴ Two strategies that can be used to design a health promotion campaign to reduce risk are presented in **TABLE 1-2**, and the advantages and disadvantages of these strategies are presented in **BOX 1-3**.

► Public and Community Health Objectives

Around the world, health promotion has proved to be an effective strategy for improving health and preventing chronic health conditions. Health promotion approaches can change lifestyles and have an impact on the social, economic, and environmental conditions that determine health.⁴⁷ The WHO is the leader in promoting health and preventing diseases throughout the world. In 1978, the WHO and the United Nations Children's Fund (UNICEF) held a conference at Alma-Ata, Union of Soviet Socialist Republics (USSR), and declared that health is more than the absence of disease; the attainment of the highest possible level of health is a vital worldwide social goal. In 1981, the Alma-Ata Declaration prompted the development of the Global Strategy for Health for All by the Year 2000. The major themes were as follows⁴⁸:

- Equity in health
- Health promotion
- Enhancing preventive activity in primary health-care settings
- Cooperation among government, community, and the private sector
- Increasing community participation

The Alma-Ata Declaration provided a good theoretical base and an ethical or moral imperative for developing a primary healthcare approach, but the framework for action was not clear. The WHO, in collaboration with

BOX 1-3 Advantages and Disadvantages of Population and Individual Health Promotion Strategies

Advantages

Population Approach

- The population approach may instigate a behavior change that may become the norm and create conditions that make it easier for any individual to change. For example, if everyone is urged to reduce fat and saturated fat intake, this increases the incentive for the food industry to develop and market products that are low in fat and/or saturated fat, such as low-fat milk, which makes it easier to adopt a low-fat diet.
- The population approach is likely to save more lives and prevent more illness than the individual approach when the risk factors are widely diffused throughout the community.

Individual Approach

- Using the individual approach, people at high risk are specifically targeted and the intervention is provided on time. More attention is given to ensuring that individuals with chronic disease are following necessary, strict dietary programs.
- Using the individual approach reduces the costs associated with screening an entire population and releases health professionals to attend to the community's other healthcare needs.

Disadvantages

Population Approach

- This approach requires mass change and may not be needed by the entire population.
- It may not be cost-effective and may inconvenience people.

Individual Approach

- With the individual approach, screening may not be universal and thus some high-risk individuals may not be identified.

Data from: Webb G. *Nutrition: A Health Promotion Approach*. 2nd ed. New York, NY: Arnold; 2002.

other organizations, subsequently co-sponsored international conferences on health promotion, which are presented in **TABLE 1-3**.

In 2000, the global community made a commitment, known as the Millennium Development Goals (MDGs), to eliminate extreme poverty and hunger and improve the health of the world's poorest people within 15 years. The eight goals agreed upon by the 191 United Nations member nations were to be achieved by 2015, and the outcomes are shown in **TABLE 1-4**.⁵¹

TABLE 1-2 Strategies for Designing a Health Promotion Campaign

	Concept	Benefit	Example
Population	Instruction is directed at the entire population (national, local community, schools, and neighborhoods) with messages and programs aimed at reducing behavioral risk factors, such as poor eating habits or physical inactivity.	Members of the community may lower their risk by a small percentage, thereby reducing new cases of chronic health conditions and mortality.	<p>A nutritionist changing the eating patterns of families and advocating for fluoridation of the water supply—rather than screening all postmenopausal women for bone loss or hiring dentists to treat every child and adolescent—may reduce the risk for osteoporosis and dental decay.</p> <p>Instruction about reducing sodium intake may reduce a population's mean systolic blood pressure by 3 percent, which will decrease the number of people in the high-risk group by 25 percent if high risk for systolic blood pressure is considered to begin at 140 mm Hg.</p> <p>If excess body weight is 92 kg/202 pounds, reducing the population's mean weight by 1 kg/2.2 pounds (approximately 1 percent) will cut the number of overweight people by 25 percent.</p> <p>Instruction could be provided to engage in regular physical activity and reduce excess calorie consumption.</p> <p>If everyone is encouraged to consume high-calcium and/or low-fat food products and then food industries develop and market these food products, this will subsequently prevent osteoporosis and obesity.</p> <p>The Fruits & Veggies—More Matters campaign is an example of a population approach to health promotion.</p>
Individual	The nutritionist focuses on identifying individuals at risk, and the intervention is directed specifically at these “high-risk” individuals.	This method may be more beneficial when the risk conditions are highly restricted, such as with preschool children who were exposed to foods containing lead.	<p>Intervention could be limited to persons with family histories of heart disease, and these people could be taught about reducing fat intake and increasing physical activities to reduce the potential of experiencing heart disease.</p> <p>Nutrition intervention could be limited to the children of adult alcoholics, individuals with a family history of diabetes, and low-income pregnant women participating in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), which may translate to risk reduction.</p>

Data from: Webb G. *Nutrition: A Health Promotion Approach*. 2nd ed. New York, NY: Arnold; 2002.

TABLE 1-3 The Sequence and Outcome of International Conferences on Health Promotion^{49,50}

Year	Title	City, Country	Health Promotion Outcomes
1986	First International Conference on Health Promotion	Ottawa, Canada	<ul style="list-style-type: none"> ■ Build healthy public policy ■ Create supportive environments ■ Develop personal skills ■ Strengthen community action ■ Reorient health services
1988	Second International Conference on Healthy Public Policy	Adelaide, Australia	<ul style="list-style-type: none"> ■ A call for action: Health promotion in developing countries
1991	Third International Conference on Health Promotion	Sundsvall, Sweden	<ul style="list-style-type: none"> ■ Addressed the issue of millions of people who are living in extreme poverty and deprivation in degraded environments that threaten their health, making the goal of Health for All by the Year 2000 very difficult to achieve
1997	Fourth International Conference on Health Promotion	Jakarta, Indonesia	<ul style="list-style-type: none"> ■ Leading health promotion into the 21st century ■ The first to be held in a developing country and the first to involve the private sector in supporting health promotion ■ Reflected on what had been learned about effective health promotion, reexamined determinants of health, and identified the directions and strategies required to address the challenges of promoting health in the 21st century ■ Five priorities for health promotion in the 21st century were: <ul style="list-style-type: none"> • Promote social responsibility for health • Increase investments for health development • Consolidate and expand partnerships for health • Increase community capacity and empower the individual • Secure an infrastructure for health promotion
2000	Fifth Global Conference on Health Promotion	Mexico City, Mexico	<ul style="list-style-type: none"> ■ Discussed how health promotion addressing the social determinants of health can help improve the lives of economically and socially disadvantaged populations
2005	Sixth Global Conference on Health Promotion	Bangkok, Thailand	<ul style="list-style-type: none"> ■ Identified actions, commitments, and pledges required to address the determinants of health in a globalized world through health promotion ■ The WHO indicated that the workplace has been established as one of the priority settings for health promotion into the 21st century because it influences physical, mental, economic, and social well-being and offers an ideal setting and infrastructure to support the promotion of health for a large audience. For example, in a review of comprehensive health promotion and disease management programs at the worksite, Pelletier⁹⁸ reported positive clinical and cost results.

TABLE 1-4 The Millennium Development Goals Progress Report⁵¹

Goal	Progress
To eradicate extreme poverty and hunger	It was reported that poverty reduced significantly in 2015 to 836 million from 1.9 billion.
To achieve universal primary education	The progress report showed that primary school enrollment increased in 2015 from 83 percent to 91 percent.
To promote gender equality and empower women	Though gender inequality and discrimination against women continues, there was a slight increase in paid employment not including agricultural from 35 percent to 41 percent.
To reduce child mortality	Report shows that global mortality rate for children less than 5 years old reduced significantly from 12.7 to 6 million.
To improve maternal health	In 2015, the ratio of maternal mortality rate reduced by 45 percent; however globally maternal mortality rate continues to be high.
To combat HIV and AIDS, malaria, and other diseases	It was reported that newly diagnosed HIV infections decreased from estimated 3.5 million cases to 2.1 million. The rate of malaria reduced by approximately 37 percent and mortality rate by 58 percent. Report shows that tuberculosis mortality rate reduced by 45 percent and the prevalence rate by 41 percent between 1999 and 2013.
To ensure environmental sustainability	It was reported that ninety-eight percent of ozone-depleting substances was eradicated in 1990.
To develop a global partnership for development	Report shows that imports from developing to developed countries were permitted duty free, which increased from 65 to 79 percent.

Source: United Nations Organization. The Millennium Development Goals Report 2015 Summary. 2016. http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20Summary%20web_english.pdf. Accessed February 24, 2016.

► Canadian Health Promotion Objectives

In Canada, preventable chronic diseases such as cardiovascular diseases, cancer, and type 2 diabetes have increased, causing a push for more health promotion at worksites to reduce the incidence of these conditions. These chronic diseases have common risk factors, including physical inactivity, poor dietary habits, and the use of tobacco.⁵² In addition, environmental factors such as personal health practices, income, employment, education, geographic isolation, and social exclusion contribute to these chronic diseases.⁵³ In 2002, Canada's federal, provincial, and territorial governments expressed the need for a pan-Canadian healthy living approach. Therefore, an extensive consultation process, including a national symposium, was organized to develop a Healthy Living Strategy. The target for the

pan-Canadian Healthy Living Strategy was to obtain a 20 percent increase in the proportion of Canadians who are physically active, eat healthily, and are at healthy body weights. The targets of the Healthy Living Strategy are as follows^{52,54,55}:

- *Healthy eating*: Proportion of children (ages 12 to 17) who reported they consumed fruit or vegetables at least five times per day showed no improvement, 45.5% from 2011 to 2012 and 43.9% in 2013.
- *Physical activity*: Proportion of children and youth (ages 5 to 17) who met physical activity guidelines by accumulating at least 60 minutes of moderate to vigorous physical activity per day increased from 4.4% to 9.3% between 2012 and 2013.
- *Healthy weights*: Proportion of children (ages 5 to 17 years) who are overweight (measured body mass index [BMI]), WHO cutoffs decreased from 19.8% to 18.6% in 2015.

- The objectives of the overall Healthy Living Strategy are⁵⁴:
 - Increased prevalence of healthy weights—achieved through healthy means among Canadians
 - Increased levels of regular physical activity among Canadians
 - Improved healthy eating practices and activity levels among Canadians, particularly infants, children, and youth
 - Increased access to affordable healthy food choices, appropriate physical activity facilities, and opportunities for at-risk and vulnerable communities
 - Improved infrastructure and neighborhood design that supports opportunities for healthy eating and physical activity
 - Reduced health disparities

A progress report in 2005 showed 50 percent of Canadians ages 18 years or older reported that they were at least moderately active. Results also revealed that 42 percent of Canadians ages 18 or older reported that they consumed fruits and vegetables five or more times per day. In addition, the BMI of almost half (47.4 percent) of Canadian adults was in the normal range. The calculation is that by 2015, Canadians ages 18 or older would be accumulating at least 30 minutes a day of moderate physical activity, 50.4 percent would report that they consumed fruits and vegetables five or more times per day, and 56.88 percent would be in the normal BMI range.⁵⁶

Reports such as the Lalonde Report (*A New Perspective on the Health of Canadians*, 1974), *Achieving Health for All* (1986), and the 1988 *Ottawa Charter on Health Promotion* have helped advance knowledge about the effect of people's lifestyles and socioeconomic circumstances on their health and well-being.⁵⁶

► Historical U.S. National Health Objectives

In the United States, health promotion and disease prevention have been public health strategies since the late 1970s and health promotion at worksites is increasing. Interest in how dietary excesses and imbalances increase the risk for chronic diseases also began in the 1970s. In 1979, *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention* provided nutritional goals for reducing premature deaths and preserving older adult independence. This publication also directed attention toward environmental and behavioral changes that Americans might make to reduce risks for morbidity and mortality.²⁶ The 1980 report *Promoting Health/Preventing Disease: Objectives for the Nation*

contained 226 objectives and provided the foundation for a national prevention agenda. It included 17 specific, quantifiable objectives in nutrition designed to reduce risks and prevent illness and death by 1990.⁵⁶ The objectives were grouped into the categories of improvement in health status, reduction of risks to health, increased awareness, improved and expanded preventive health services, and improved surveillance.⁵⁷ This effort was moderately successful. Three of the four mortality-related goals were met or exceeded. Specifically, the infant and adult mortality goals were met, and the childhood mortality target was significantly exceeded. The mortality goal for adolescents was not met due to high rates of both unintentional (motor vehicle accidents) and intentional (homicide) fatal injuries in this age group.⁵⁷

The 1988 Surgeon General's Report on Nutrition and Health stimulated health promotion and disease prevention actions. Detailed information on dietary practices and health status was included in this report, which also included specific science-based health recommendations. It included implications for the individual and for future public health policy decisions. This report is still a useful reference and tool for nutrition-related health promotion.^{26,30,58} In the late 1980s, the Public Health Service and a team of health educators and U.S. government officials analyzed the results of research studies, reports, and recommendations that summarized the health status of Americans. Subsequently, in 1991, these experts published their findings in a report called *Healthy People 2000: The National Health Promotion and Disease Prevention Objectives*. This document contained the following three general goals²¹:

- Increase the span of healthy life
- Reduce health disparities among Americans
- Achieving access to preventive services

The majority of the 27 nutrition objectives were either met or at least moved toward their year 2000 targets. However, for some objectives the progress was modest and for others there was movement away from the targets; for example, smoking during pregnancy increased among teenagers, with significant increases among African American and Puerto Rican teens. On the positive side, the prevalence of high blood cholesterol among people ages 20 to 74 years decreased to a level that met its target. Growth retardation among low-income children ages 5 years or younger exceeded its target, declining from 11 percent in 1987 to 8 percent in 1999. The percentage of elementary and secondary schools offering low-fat choices for breakfast and lunch increased noticeably, although by the end of the decade, only about one in five schools offered lunches that met goals for total fat and saturated fat content. Other nutrition objectives also showed improvement during the

1990s. The average fat intake among people age 2 years or older declined and the proportion of the population who consumed no more than 30 percent of calories from fat increased. The availability of reduced-fat processed foods increased to such an extent that the 2000 target was surpassed early in the decade. Informative nutrition labeling was found on more processed foods, fresh produce, and fresh seafood. Similar labeling of fresh meat and poultry, however, decreased.⁵⁹

► Healthy People in Healthy Communities

A healthy community embraces the belief that health is more than merely an absence of disease. A healthy community includes those elements that enable people to maintain a high quality of life and productivity. For example, a healthy community offers access to healthcare services that focus on both treatment and prevention for all members of the community in a secure environment.⁶⁰

Healthy People 2010

The continued success of Healthy People 2000 encouraged the creation of a new set of objectives to be achieved by 2010. **Healthy People 2010** was designed to serve as a roadmap for improving the health of all people in the United States. It included national health promotion and disease prevention goals, objectives, and measures that served as a model for nutrition and health practitioners to develop their own goals and objectives and improve the health of everyone in the community.^{35,61} Healthy People 2010 was designed to achieve the following two overarching goals⁶¹:

- Increase the quality and years of healthy life
- Eliminate health disparities. (A health disparity is a gap in the health status of different groups of people in which one group is healthier than the other group or groups.)

These two goals were supported by 467 objectives in 28 specific focus areas, including cancer; diabetes; nutrition and overweight; access to quality health services; food safety; maternal, infant, and child health; heart disease; and stroke. The focus areas are presented in **TABLE 1-5**.⁴⁶ The major challenge of Healthy People 2010 was balancing a broad set of health objectives with a smaller set of health priorities. Consequently, the 10 leading health indicators presented in **TABLE 1-6** served as a link to the original 467 objectives in Healthy People 2010 and have served as the foundation for many state and community health initiatives. They included national health promotion and disease prevention goals, objectives, and measures that helped serve as a model for nutrition and health

practitioners to develop their own goals and objectives to improve the health of everyone in the community.

The Leading Health Indicators reflected the major public health concerns in the United States and were chosen based on their ability to motivate action, the availability of data to measure their progress, and their relevance as broad public health issues. Furthermore, some states and communities used the Leading Health Indicators as a framework to plan programs directed at promoting health and preventing diseases.

Healthy People Progress Report

An important part of Healthy People 2010 was assessing progress toward the targeted objectives. The first goal of Healthy People 2010 was to help individuals of all ages increase quality and years of healthy life. A review of the data shows that years of life measured in terms of life expectancy increased. However, significant gender, racial, and ethnic differences exist. Women continue to live longer than men. African American men and women are still behind Caucasian American men and women in

TABLE 1-5 Healthy People 2010 Focus Areas⁴⁶

1. Access to Quality Health Services
2. Arthritis, Osteoporosis, and Chronic Back Conditions
3. Cancer
4. Chronic Kidney Disease
5. Diabetes
6. Disability and Secondary Conditions
7. Educational and Community- Based Programs
8. Environmental Health
9. Family Planning
10. Food Safety
11. Health Communication
12. Heart Disease and Stroke
13. HIV
14. Immunization and Infectious Diseases
15. Injury and Violence Prevention
16. Maternal, Infant, and Child Health
17. Medical Product Safety
18. Mental Health and Mental Disorders
19. Nutrition and Overweight
20. Occupational Safety and Health
21. Oral Health
22. Physical Activity and Fitness
23. Public Health Infrastructure
24. Respiratory Diseases
25. Sexually Transmitted Diseases
26. Substance Abuse
27. Tobacco Use
28. Vision and Hearing

Source: U.S. Department of Health and Human Services, Healthy People 2010. <http://www.health.gov/healthypeople/>. Accessed February 20, 2017.

TABLE 1-6 The Objectives and Subobjectives Used to Track Progress Toward the Leading Health Indicators

Objectives	Leading Health Indicators
Physical Activity Objective 22-2 Objective 22-7	Increase the proportion of adults who engage in moderate physical activity for at least 30 minutes per day 5 or more days per week or vigorous physical activity for at least 20 minutes per day 3 or more days per week. Increase the proportion of adolescents who engage in vigorous physical activity that promotes cardiorespiratory fitness 3 or more days per week for 20 or more minutes per occasion.
Overweight and Obesity Objective 19-2 Objective 19-3c	Reduce the proportion of adults who are obese. Reduce the proportion of children and adolescents ages 6–19 who are overweight or obese.
Tobacco Use Objective 27-1a Objective 27-1b	Reduce tobacco use by adults—cigarette smoking. Reduce tobacco use by adolescents—cigarette smoking.
Substance Abuse Objective 26-10a Objective 26-10c Objective 26-11c	Increase the proportion of adolescents not using alcohol or any illicit drugs during the past 30 days. Reduce the proportion of adults using any illicit drug during the past 30 days. Reduce the proportion of persons ages 18 years or older engaging in binge drinking of alcoholic beverages.
Responsible Sexual Behavior Objective 13-6 Objective 25-11	Increase the proportion of sexually active persons who use condoms. Increase the proportion of adolescents who abstain from sexual intercourse or use condoms.
Mental Health Objective 18-9b	Increase the proportion of adults ages 18 years or older with recognized depression who receive treatment.
Injury and Violence Objective 15-5 Objective 15-32	Reduce deaths caused by motor vehicle crashes. Reduce homicides.
Environmental Quality Objective 8-1a Objective 27-10	Reduce the proportion of persons exposed to air that does not meet the U.S. Environmental Protection Agency’s health-based standards for harmful air pollutants—ozone. Reduce the proportion of nonsmokers exposed to environmental tobacco smoke.
Immunization Objective 14-24 Objective 14-29a Objective 14-29b	Increase the proportion of young children and adolescents who receive all vaccines that have been recommended for universal administration for at least 5 years. Increase the proportion of noninstitutionalized adults who are vaccinated annually against influenza. Increase the proportion of noninstitutionalized adults who are ever vaccinated against pneumococcal disease.

TABLE 1-6 The Objectives and Subobjectives Used to Track Progress Toward the Leading Health Indicators (continued)

Objectives	Leading Health Indicators
Access to Health-care	
Objective 1-1	Increase the proportion of persons with health insurance.
Objective 1-4a	Increase the proportion of persons of all ages who have a specific source of ongoing care.
Objective 16-6a	Increase the proportion of pregnant women who receive early and adequate prenatal care beginning in the first trimester.

Source: U.S. Department of Health and Human Services. <http://www.health.gov/healthypeople/>. Accessed March 04, 2016.

overall life expectancy, although the average number of years lived for African American men and women has increased. Although U.S. life expectancy has increased, the life expectancy in other developed countries is still higher.

The second national goal for Healthy People 2010 was the elimination of health disparities related to social disadvantage in the United States. Disparities in deaths and risk factors for death remain unchanged among Caucasian Americans and minorities in mortality, morbidity, health insurance coverage, and the use of health services.⁶² According to national data from the period 2003 to 2006⁶³:

- The proportion of young people ages 6 to 19 years who were overweight or obese was 17 percent, an increase from 11 percent.
- The age-adjusted proportion of adults ages 20 years or older whose weight was in the healthy range was 32 percent, a decrease from 42 percent; the 2010 target was 60 percent. This downward trend in healthy weight carries across all demographic groups for whom data were collected, including Mexican American, non-Hispanic black, and non-Hispanic white. The trend also prevails across genders and income levels.
- The age-adjusted proportion of adults ages 20 years or older who were obese (BMI of 30 or more) was 33 percent, with a baseline of 23 percent; the target was 15 percent. Increases in this proportion were evident in all racial and ethnic groups for whom data were collected, including Mexican Americans (rising from 29 percent to 35 percent over that period), African Americans (from 30 percent to 45 percent), and Caucasian Americans (from 22 percent to 32 percent).
- Overweight and obesity in children ages 6 to 11 years increased from 11 percent to 17 percent. In adolescents ages 12 to 19 years, the increase over the same period was from 11 percent to 18 percent. The proportion of children and adolescents who were overweight or obese increased for all racial and ethnic groups surveyed.

- The proportion of people age 2 years or older (age-adjusted) who ate at least two servings of fruit per day increased slightly from 39 percent to 40 percent. The target was 75 percent.
- There was little or no change in the proportion of the population meeting the criteria for vegetable intake of at least three daily servings, with at least one-third being dark green or orange.

Data on the achievement of past **Healthy People Objectives** are presented in **TABLE 1-7**.

Healthy People 2020

As with earlier Healthy People initiatives, Healthy People 2020 is a national health agenda that communicates a vision and a strategy for improving the health of the U.S. population and achieving health equity for the next decade. Healthy People 2020 retains the practice of previous Healthy People initiatives of promoting and improving the health of every individual in the United States. Healthy People 2020 is designed to make health determinants a primary focus and healthcare a secondary focus.⁶³

Health determinants are the variety of personal, social, economic, and environmental factors that determine the health status of individuals or populations. They are embedded in our social and physical environments. *Social determinants* include family, community, income, education, sex, race/ethnicity, geographic location, and access to healthcare, among others. *Physical determinants* include our natural and built environments, exposure to toxins (e.g., coal tar), manmade pollutants, or substandard housing.

The vision of Healthy People 2020 is a society in which all people live long, healthy lives. Its mission includes the following:

- Improve health through strengthening policy and practice
- Identify nationwide health improvement priorities

TABLE 1-7 Recent Data on Achievement of Past Healthy People Objectives⁶³

Most Recent Data	Number of Objectives/ Targets	Achieved Target (%)	Progressed Toward Target (%)	Showed No Progress or Regressed from Target (%)	Data Unavailable (%)
1990 Health Objectives (Final Review) NCHS, 1992	226 objectives, 266 targets*	32	34	11	23
Healthy People 2000 [†] (Final Review) NCHS, 2001	319	21	41	17	10
Healthy People 2010 (Midcourse Review) HHS, 2006 [‡]	467	6	30	16	40 [‡]

* All percentages for the 1990 Health Objectives reflect attainment of the 266 measured targets.

† Percentages for Healthy People 2000 Objectives do not add up to 100 percent in this table because 11 percent of objectives (35) that showed mixed progress have been excluded.

‡ This percentage includes 28 objectives that were deleted, as well as 158 objectives that could not be assessed due to a lack of tracking data.

§ Percentages for Healthy People 2010 Objectives do not add up to 100 percent in this table because 12 percent of objectives (57 of 467) that showed mixed progress have been excluded.

Reproduced from: U.S. Department of Health and Human Services. The Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020 October 28 2008.

- Increase public awareness and understanding of the determinants of health, disease, and disability and the opportunities for progress
- Provide measurable objectives and goals that can be used at the national, state, and local levels
- Engage multiple sectors to take actions that are driven by the best available evidence and knowledge
- Identify critical research and data collection needs

The overarching goals for Healthy People 2020 are as follows⁶³:

- *Eliminate preventable disease, disability, injury, and premature death.* This goal supports health promotion and disease prevention for all U.S. populations, including those with or without evident health problems. It includes people with significant diseases or health conditions that cannot be prevented or cured with the application of current knowledge. Health promotion and disease prevention efforts can slow functional declines or improve a person's ability to live independently and participate in daily activities and community life.
- *Achieve health equity and eliminate health disparities.* This goal deals with important determinants of health disparities that can be influenced by institutional policies and practices. These include disparities in healthcare, but also in other health determinants,

such as living and working conditions. Social policies related to education, income, transportation, and housing are powerful influences on health, because they affect factors such as the types of food one can buy, the quality of the housing and neighborhood where one can live, the quality of one's education, and one's access to good quality medical care.

- *Create social and physical environments that promote good health for all.* This goal advocates an ecological approach to health promotion. It suggests that health and health behaviors are determined by influences at multiple levels, including the personal (e.g., biological and psychological), organizational and institutional, environmental (e.g., social and physical), and policy levels. Policies that can improve the income of low-income persons and communities; for example, education, job opportunities, and improvements to public infrastructure may improve population health. Improving rewards for productive economic activity, whether by eliminating disparities in pay for equal work due to discrimination or by reducing taxes for earnings of low-income persons, could promote the economic well-being of vulnerable populations and thereby contribute to their health.
- *Promote healthy development and healthy behaviors at every stage of life.* This goal addresses human development across the life span because exposures in early life can be linked to outcomes in later life.

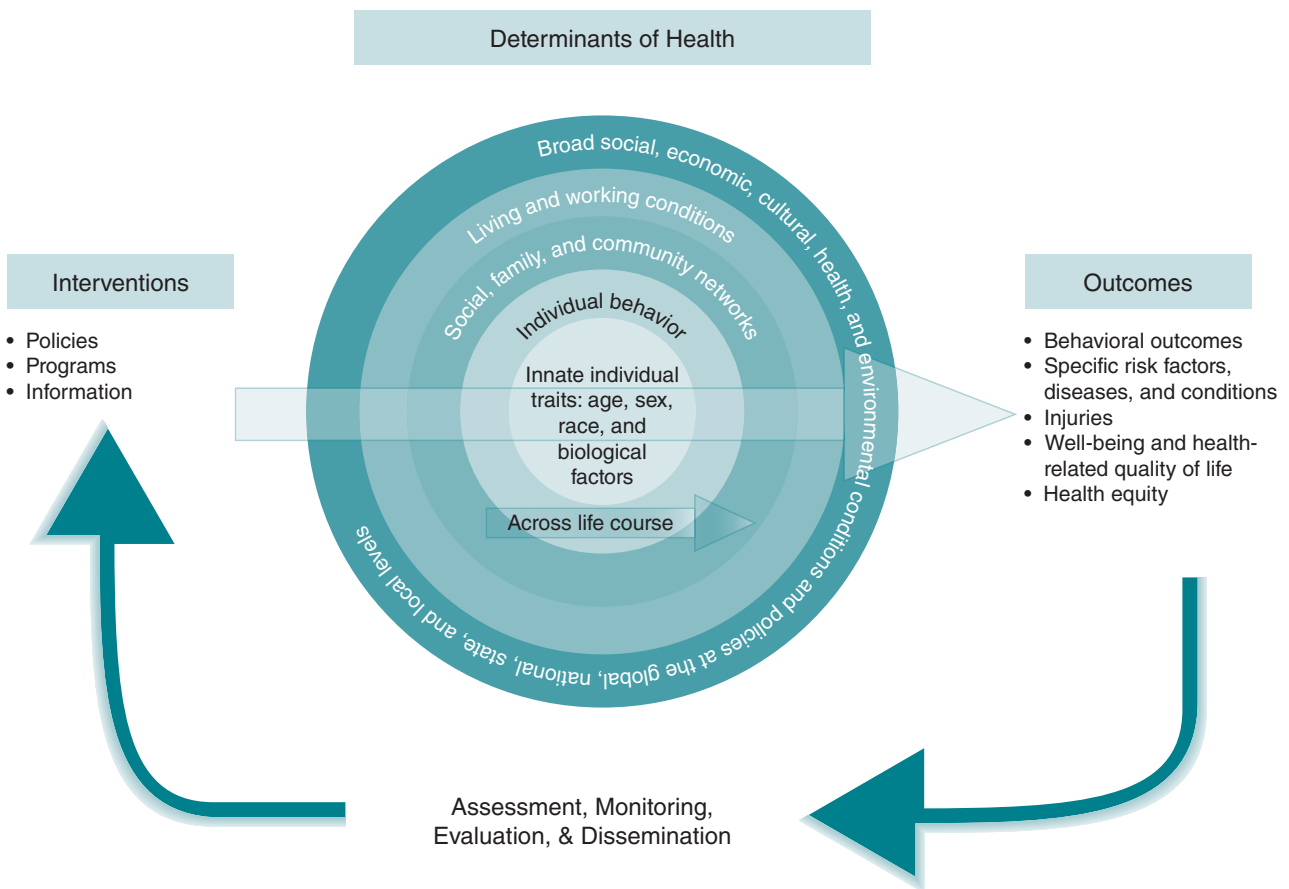


FIGURE 1-4 Action model for achieving Healthy People 2020 Goals.

Reproduced from: U.S. Department of Health and Human Services.

It states that the prenatal and adult periods can be bridged by studying how early life factors (e.g., lack of prenatal care, gestational diabetes, and others) together with later life factors (e.g., lack of education, low income, etc.) contribute to health outcomes and identifying risk and preventive processes across the life course.⁶⁴

FIGURE 1-4 presents an action model to guide the achievement of the Healthy People 2020 goals. The Action Model⁶⁵ to Achieve Healthy People Goals represents the impact of interventions (e.g., policies, programs, and information) on determinants of health at multiple levels (e.g., individual; social, family, and community; living and working conditions; and broad social, economic, cultural, health, and environmental conditions) to improve outcomes. The results of such interventions can be demonstrated through assessment, monitoring, and evaluation. Through dissemination of evidence-based practices and best practices, these findings would feed back to intervention planning to enable the identification of effective prevention strategies in the future. A feedback loop of intervention, assessment, and dissemination of evidence and best practices would enable achievement of Healthy People 2020 goals. **TABLE 1-8** presents 2020 focus areas.

TABLE 1-8 Healthy People 2020 Focus Areas

1. Access to Health Services
2. Adolescent Health
3. Arthritis, Osteoporosis and Chronic Back
4. Blood Disorders and Blood Safety
5. Cancer
6. Chronic Kidney Disease
7. Dementias, Including Alzheimer’s Disease
8. Diabetes
9. Disability and Health
10. Early and Middle Childhood
11. Educational and Community-Based Programs
12. Environmental Health
13. Family Planning
14. Food Safety
15. Genomics
16. Global Health
17. Healthcare-Associated Infections
18. Health Communication and Health Information Technology
19. Health-Related Quality of Life and Well-Being
20. Hearing and Other Sensory or Communication Disorders

(continues)

TABLE 1-8 Healthy People 2020 Focus Areas
(continued)

21. Heart Disease and Stroke
22. HIV
23. Immunization and Infectious Disease
24. Injury and Violence Prevention
25. Lesbian, Gay, Bisexual, and Transgender Health
26. Maternal, Infant, and Child Health
27. Medical Product Safety
28. Mental Health and Mental Disorders
29. Nutrition and Weight Status
30. Occupational Health
31. Older Adults
32. Oral Health
33. Physical Activity
34. Preparedness
35. Public Health Infrastructure
36. Respiratory Diseases
37. Sexually Transmitted Diseases
38. Sleep Health
39. Social Determinants of Health
40. Substance Abuse
41. Tobacco Use
42. Vision

Source: U.S. Department of Health and Human Services, Healthy People 2020. http://www.cdc.gov/nchs/healthy_people/hp2020/hp2020_topic_areas.htm. Accessed March 4, 2016.

► Knowledge and Skills of Public Health and Community Nutritionists

In most instances, a community or public health nutritionist must be a member of an **interdisciplinary team** to provide an effective nutrition program. An interdisciplinary team is a collaboration among personnel representing different disciplines of public health workers (nurses, social workers, physicians, daycare workers, dietitians, and dietetic technicians). They use various approaches to diagnose and address public or community issues, including the following²³:

- Using interventions that promote health and prevent communicable or chronic diseases by managing or controlling the community's environment
- Channeling funds and energy to problems that affect the lives of the largest numbers of people in a community
- Seeking unserved or underserved populations (due to income, age, ethnicity, heredity, or lifestyle) and those who are vulnerable to disease, hunger, or malnutrition

- Collaborating with the public, consumers, community leaders, legislators, policy makers, administrators, and health and human service professionals to assess and respond to community needs and consumer demands
- Monitoring the public or community's health in relation to public health objectives and continuously addressing current and future needs
- Planning, organizing, managing, directing, coordinating, and evaluating the nutrition component of health agency services

For community nutritionists to accomplish these actions, they need to acquire normal and clinical nutrition knowledge and be skilled in educating the public regarding changes in eating behavior. The minimum education requirements for a community nutritionist include a bachelor's degree in foods and nutrition or dietetics from an accredited college or university and a Master of Public Health degree with a major in nutrition or a Master of Science degree in applied human nutrition with a minor in public health or community health.²³ Some community nutrition positions require certification as a **Registered Dietitian (RD)** and/or an advanced degree in nutrition. Academic training includes knowledge of biostatistics and skill in collecting, analyzing, and reporting demographic, health, and food nutrition data.^{66,67}

The community nutritionist must understand the epidemiology of health and disease patterns in the population as well as trends of diseases over a long period. He or she must be knowledgeable about the principles of health education, program planning, program **evaluation**, community organization, management, marketing, and policy formation.⁶⁸

Marketing skills are very important because they help nutritionists know how to convey effective nutrition messages using a variety of media formats for their audiences. Community nutritionists must keep current with advances in research and food and nutrition sciences, and changing practices in public health service.⁶⁷

In some situations, Dietetic Technicians, Registered (DTRs), are employed in the food service area, clinical settings, and community settings. They may assist the community nutritionist or RD in determining the community's nutritional needs and in providing community nutrition programs and services. At a minimum, DTRs must have an associate's degree from an approved educational program. After that, they must successfully complete a national examination administered by the Commission on Dietetic Registration (CDR).

Community and public health nutritionists provide a wide variety of nutrition services through government and nongovernment agencies at the local, state, national, and international levels.²³ In most cases, the activities

require multitasking roles such as blood pressure screening, diet counseling, and medical nutrition therapy. At the international level, duties may include education on sanitation, water purification, and gardening.

► Places of Employment for Public Health and Community Nutritionists

Community and public health nutritionists work in official community settings or voluntary agencies to promote health, prevent disease, conduct epidemiological research, and provide both primary and secondary preventive care. The agencies include city, county, state, federal, and international agencies.²³ The following are examples of places where community and public health nutritionists may be employed:

State, City, and County Level

- Cooperative extension services
- Home healthcare agencies
- Hospital outpatient nutrition education departments
- Local public health agencies
- Migrant worker health centers
- Native American health services
- Neighborhood or community health centers
- Nonprofit and for-profit private health agencies
- Universities, colleges, and medical schools
- Wellness programs

National and Regional Level

- U.S. Food and Drug Administration (FDA)
- U.S. Department of Agriculture (USDA)
- U.S. Department of Health and Human Services (DHHS)

International Level

- Food and Agriculture Organization of the United Nations (FAO)
- Pan American Health Organization (PAHO)
- United Nations (UN)
- UNICEF
- World Food Agency (WFA)
- Supermarket or grocery store
- WHO

► Ethics and Community Nutrition Professionals

Community and public health nutritionists must abide by the Academy of Nutrition and Dietetics (AND) ethical

code, regardless of where they practice. **Ethics** is the study of the nature and justification of principles that guide human behaviors and are applied when moral problems arise.^{8,69} The AND Ethics Committee is a joint committee of the Board of Directors, House of Delegates, and Commission on Dietetic Registration. Its purpose is to review, promote, and enforce the AND and Commission on Dietetic Registration Code of Ethics for the Profession of Dietetics (<http://www.eatright.org/codeofethics>). The committee is also responsible for educating members, credentialed practitioners, students, and the public about the ethical principles of the Code of Ethics. There are 19 principles in the code, which covers the diversity in the dietetic profession⁷⁰ (see Chapter 15).

In promoting health and preventing diseases, community and public health nutritionists have the responsibility to provide accurate and reliable information so their clients can make appropriate choices. They must interpret **evidence-based** scientific information without bias to enable the community or clients to make informed decisions. The nutritionist maintaining consistent ethical behavior will increase the level of the public, community, or client trust in the nutritionist's profession. In 2002, the ANDs' *Nutrition and You: Trends*⁷¹ reported that a majority (51 to 55 percent) surveyed indicated that dietitians are a credible source on topics that included obesity, dietary supplements, food irradiation, and genetically modified foods. It is important that, as a profession, all nutritionists and dietitians continue to maintain this professionalism.

However, sometimes principles collide or do not resolve the moral conflict or dilemma. That is when the theory of moral virtues for healthcare professionals can be useful. This set of virtues was established by the American Board of Internal Medicine in 1984 as the definition of a virtuous clinician. The virtues include the following^{72,73}:

- *Integrity*: Telling the truth, keeping promises, and being able to do what one claims to do. For example, a community nutritionist violated her integrity after a food safety workshop by providing a list of kosher meat shops to her Jewish clients that included her uncle's meat shop—with a discount of 25 percent—without informing them that his meat is not kosher. The Jewish clients did not know that her uncle owned the shop and that his meat is not kosher.
- *Respect*: Treating other people as having worth and involving them as partners in the clinical or educational encounter.
- *Compassion*: Being able and willing to experience suffering from the client's perspective and allowing that experience to guide the behavior of the healthcare provider and community nutritionist.

Think About It

What ethical or moral violations has Eugene, a community nutritionist, committed?

Eugene read an article published in the *ADA TIMES* discussing Muslim dietary guidelines and the percentage of Muslim Americans born in the United States who observe the dietary practice of eating foods that are halal (permitted under Islamic law). The article also listed foods that are not halal. Eugene has to make a difficult decision about recommending foods that are high in vitamin B₆ and thiamin to vitamin-deficient Muslim teenage mothers who have recently arrived in the United States. Because pork is a good source of vitamin B₆ and thiamin, which can improve their nutritional status and reduce their deficiencies, he asked them to consume pork and products containing pork. Another reason for his recommendation is limited community resources and language barriers.

► Preventive Nutrition

Preventive nutrition can be defined as dietary practices and interventions directed toward a reduction in disease risk and/or improvement in health outcomes.⁷⁴ Preventive nutrition is an important strategy that works to prevent disease instead of treating the condition after it materializes. The U.S. government and other health agencies have taken actions to reduce the incidences of chronic diseases, such as recommending a reduction in saturated fat intake for cardiovascular disease prevention and inclusion of B vitamins, vitamins A and D, iron, and calcium in staple foods such as grain products, milk, and cereals to prevent nutrient-related health conditions.^{75,76} These preventive nutrition strategies have been part of public health policy for many years and have been effective in preventing nutrition-related health conditions.^{77,78} For example, there has been a decrease in cardiovascular disease mortality in the past 25 years due to the massive campaign to reduce fat intake and increase physical activity in the United States and most industrialized countries.^{28,79}

Other concerns have prompted policy changes regarding prevention of chronic diseases. The high costs of medical care put economic pressure on both individuals and nations to prevent chronic diseases. The cost of cardiovascular diseases and stroke in the United States each year was estimated at \$312.6 billion.⁸⁰ Estimates show that \$22 billion per year could be saved in this disease category if preventive nutrition measures were fully implemented.⁷⁴

Another disease category that could be significantly affected if prevention were emphasized more strongly is that of birth defects. Birth defects in infants are the leading cause of hospitalizations.⁸¹ Research shows that the possibility of reducing infant morbidity and mortality through nutritional interventions becomes a tangible outcome when women who take a folic acid-containing multivitamin daily for at least 1 month before conception and during their pregnancies have

approximately a 50 percent decrease in neural tube defects.^{81,82} This outcome alone is expected to save approximately \$70 million annually.⁷⁴

In addition, a decrease in medical care for breastfed infants is the primary socioeconomic benefit of breastfeeding. Medicaid costs for infants breastfed by low-income mothers in Colorado were \$175 lower than for infants who were fed formula.⁸³ In addition, breastfed infants are less likely to have any illness during the first year of life. It is reported that infants who were never breastfed required more care for lower respiratory tract illness, otitis media (ear infection), and gastrointestinal disease than infants breastfed for at least 3 months.⁸⁴

The effectiveness of nutrition education is related to applicable use of behavior science theories and models (see Chapter 13). These models assist healthcare professionals to formulate an action plan that meets the needs and capabilities of the individuals making health behavior changes. The Health Belief Model (HBM) is one of the health education models (derived from behavior science theory) that has been successful in providing nutrition education.⁸⁵ One of the components of HBM is perceived benefits of health action.

For instance, a study was carried out to compare the effect of a nutritional educational program based on HBM with traditional education among pregnant women. The target population was pregnant women residing in Gonabad attending an urban healthcare centers for prenatal care. Of 1,388 pregnant women, 110 (HBM group: 54, control group: 56) were selected in the first stage of prenatal care (6th to 10th week). The interview based on HBM was performed in two sessions of nutritional education using live lecture and group discussions. In the control group, nutrition education during pregnancy was performed in healthcare centers without using the educational model. Posttest based on two sessions of nutritional education in a similar pattern to pretest was performed for HBM and control groups in the 38th to 40th weeks of pregnancy. Results shows no significant differences in nutritional behavior mean score before the intervention program. However,

after intervention, there was a significant difference in HBM structure mean score compared with the control group and the highest increase in score was related to perceived benefits (15.13 increment). In addition, this study showed that nutritional education based on HBM for recommended weight gain during pregnancy was successful compared with traditional education.⁸⁵

► Nutrition Care Process: Evidence-Based Practice

The AND plays a significant role in preventing nutrition-related diseases and improving health outcomes. One of the nutrition and health-related efforts of the AND was the establishment of the **Nutrition Care Process and Model (NCPM)**, presented in **FIGURE 1-5**. The NCPM is a systematic problem-solving method that food and nutrition professionals use to critically

evaluate nutrition-related problems and make decisions regarding them.⁸⁶ It provides a consistent framework for food and nutrition professionals to use when delivering nutrition care and is designed for use with patients, clients, groups, and communities of all ages and conditions of health or disease.⁸⁷ It contains the following four separate but interrelated steps.

- Nutrition assessment
- Nutrition diagnosis (problems)
- Nutrition intervention
- Nutrition monitoring and evaluation

Each step informs the subsequent step. As new information is collected, a food and nutrition professional may revisit previous steps of the process to reassess, add, or revise nutrition diagnoses, modify interventions, or adjust goals and monitoring parameters. The outer ring of the NCPM influences how clients receive nutrition information. The practice setting reflects

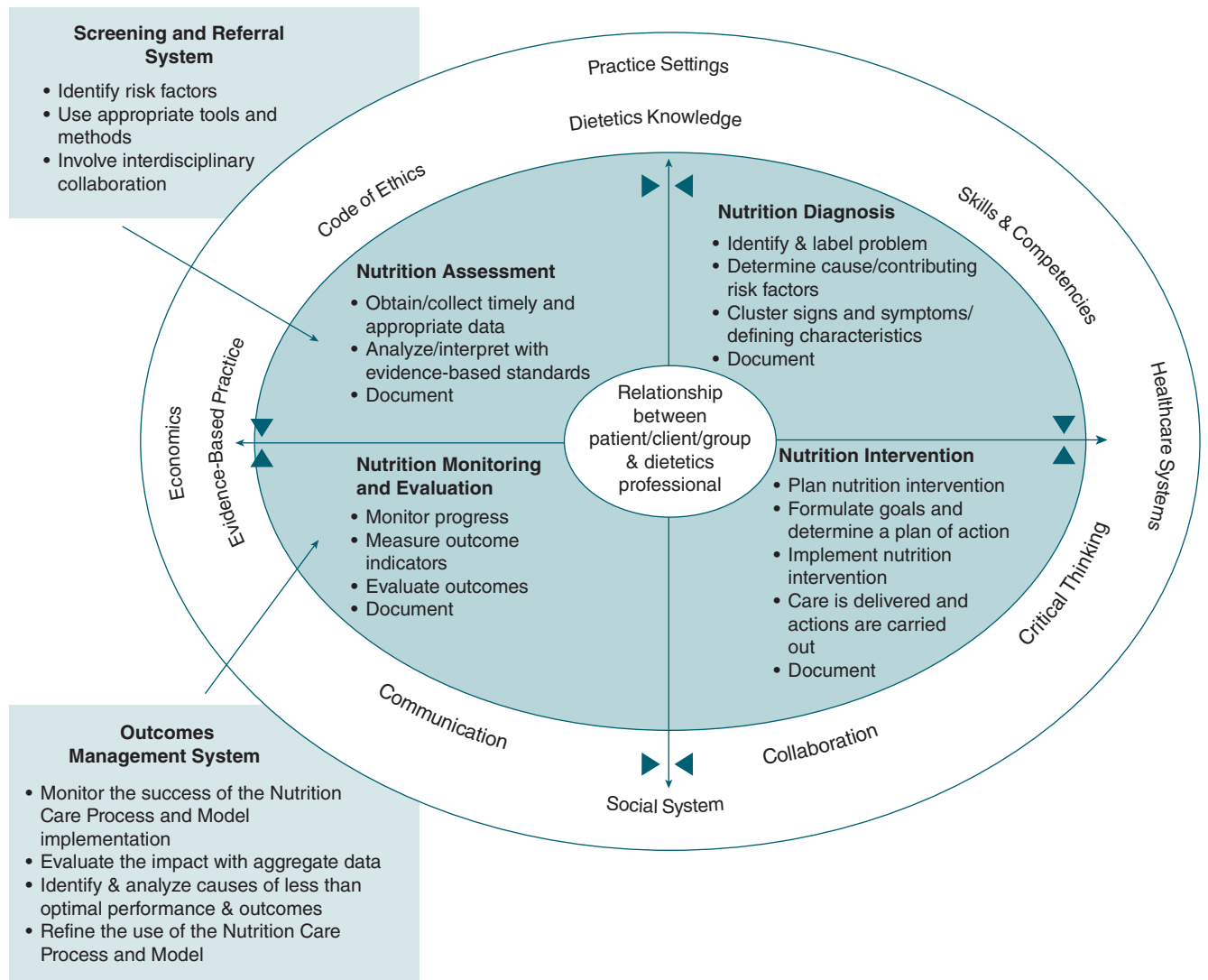


FIGURE 1-5 The nutrition care process model.

Reprinted from Journal of the American Dietetic Association, 108:7, Nutrition Care Process and Model Part I: The 2008 Update. Writing group of the Nutrition Care Process/Standardized Language Committee, 1113-1117, Copyright (2008), with permission from Elsevier.

rules and regulations governing practice, the age and health conditions of particular clients, and how a food and nutrition professional's time is allocated. The social system reflects clients' health-related knowledge, values, and the time devoted to improving nutritional health. The economic aspect incorporates resources allocated to nutrition care, including the value of a food and nutrition professional's time in the form of salary and reimbursement. The middle ring of the NCPM distinguishes the unique professional attributes of food and nutrition professionals from those in other professions. The inner ring illustrates the four steps of the NCPM. The central core of the model depicts the essential and collaborative partnership with clients. The model is intended to reflect the dynamic nature of relationships throughout the NCPM.

The AND developed a standardized language for the NCPM to describe the activities of RDs within each of the four steps. For example, the term for identifying and labeling clients with a nutrition diagnosis regarding nutrient intake could be *suboptimal vitamin intake* or *inadequate protein intake*.⁸⁸

Community nutritionists and other dietetic professionals are very familiar with three aspects of the NCPM (nutrition assessment, **nutrition intervention**, and **nutrition monitoring and evaluation**). However, there is also a less well-defined aspect of nutrition care: **nutrition diagnosis**.⁸⁸ Each step will be explained in the following sections.

Community and public health nutritionists can use the NCPM to develop, plan, monitor, and implement high-quality nutrition services to their clients in the community. In this textbook, problem-based and critical thinking situations are presented in the form of case studies for each chapter, with blank NCPM charts provided in the student's manual.

The Nutrition Care Process Step 1: Nutrition Assessment

Nutrition assessment is discussed in detail in Chapter 2. It involves the systematic gathering, verifying, and interpreting of data needed to identify nutrition-related problems, their causes, and their significance. Nutrition assessment involves initial data collection, but also continual reassessment and analysis of the client's status compared to specified criteria.⁸⁸ Nutrition assessment may include the following data sources when identifying nutrition-related problems: interviewing, community-based survey, epidemiological studies, observations, medical records, focus groups, key informants, community forum, and information gained from other healthcare providers or agencies. If a problem is identified, the community nutritionist can

then label the problem and create a problem, etiology, and signs and symptoms (PES) statement in Step 2 of the NCPM (discussed next).

Critical thinking skills are very important for the selection, collection, and interpretation of relevant data. *Critical thinking* is the way individuals learn to assess and modify a situation before acting. A critical thinker is simultaneously problem solving and self-improving his or her thinking ability.⁸⁹ Critical thinking skills are required for good diagnostic reasoning and clinical judgment. Examples of critical thinking skills are as follows⁸⁸:

- Determining appropriate data to collect about your clients
- Determining the need for additional information for your clients
- Selecting assessment tools and procedures that match the situation and alternative possibilities
- Applying assessment tools in valid and reliable ways
- Distinguishing relevant from irrelevant data
- Validating the data

In the development of the standardized nutrition diagnosis language, five domains of nutrition assessment were identified: food and nutrition-related history, biochemical data, anthropometric measurements, physical findings, and client history. **TABLE 1-9** presents the five domains of nutrition assessment.

The Nutrition Care Process Step 2: Nutrition Diagnosis

Nutrition diagnosis is a critical step between nutrition assessment and nutrition intervention. The reason for this step is to identify and label specific nutrition problems that nutritionists can independently resolve or improve through nutrition intervention. The nutrition diagnosis is summarized into a structured sentence called a nutrition diagnosis statement or a PES statement.⁸⁸ The etiology and the signs and symptoms are determined during nutrition assessment. The standard phrases included in a nutrition diagnosis statement are “related to” and “evidenced by.” The following is an example of a PES:

A group of pregnant high school teenagers in a Midwestern city (target population) are obese and anemic (problem) *related to* frequent consumption of high-fat food and sugary drinks from vending machines plus low iron intake and physical inactivity (etiology) as *evidenced by* BMI between 27 and 30, hemoglobin level of less than 10 g/dl, and spoon-shaped fingernails, as well as vending machines in and around the high school containing high-fat chips and sugary soft drinks (signs and symptoms).

TABLE 1-9 The Five Categories of Nutrition Assessment

Food and Nutrition–Related History	Anthropometric Measurements	Biochemical Data, Medical Tests, and Procedures	Nutrition-Focused Physical Findings	Client History
Food and nutrient intake, food and nutrient administration, medication and herbal supplement use, knowledge and beliefs, food and supplies availability, physical activity, nutrition, and quality of life	Height and weight, body mass index, and growth pattern indices/percentile ranks, and weight history	Laboratory data (e.g., electrolytes, glucose) and tests (e.g., gastric emptying time, resting metabolic rate)	Physical appearance, muscle and fat wasting, swallow function, appetite, and affect	Personal, family social, medical, and health, history; treatments and complementary or alternative medicine use

Nutrition assessment data (indicators) are compared to criteria and relevant norms and standards, for interpretation and decision making. These may be national, institutional, or regulatory norms and standards. Nutrition assessment findings are documented in nutrition diagnosis statements and nutrition intervention goal setting.

Source: Modified from International Dietetics and Nutrition Terminology. *International Dietetics and Nutrition Terminology (IDNT) Reference Manual: Standardized Language for the Nutrition Care Process*, 3rd ed. Chicago, IL: American Dietetic Association; 2011:13.

The community and public health nutritionist's PES statement needs to be clear and concise. It is important to define the main nutrition problem related to the community or clients. In some cases more than one problem may occur. It is practical to first address the most important and urgent problem. The nutritionist must ask critical thinking questions to clarify the nutrition diagnosis when he or she is specifying the diagnosis and writing the PES statement. The nutritionist can evaluate the PES statement using the following example⁸⁸:

P: Can the nutritionist resolve or improve the nutrition diagnosis for this community, individual, group, or population?

E: Can the nutritionist evaluate what was used as the etiology to determine whether it is the root cause to address with a nutrition intervention to reduce the signs and symptoms?

S: Can measuring the signs and symptoms show that the problem is resolved or improved?

PES overall: Do the nutrition assessment data support a particular nutrition diagnosis with a typical etiology, signs, and symptoms?

The most distinctive feature of the NCPM is the nutrition diagnosis. The AND recognizes more than 60 nutrition diagnoses/problems, which have been given labels that are grouped into three domains: intake, clinical, and behavioral-environmental. Each domain represents unique characteristics that contribute to nutrition-related health conditions. Within each domain are classes and,

in some cases, subclasses of nutrition diagnosis.⁸⁸ The details of each are presented in **TABLE 1-10**.

The Nutrition Care Process Step 3: Nutrition Intervention

The purpose of the nutrition intervention step of the NCPM is to take specific action that can resolve or improve the identified nutrition problem or diagnosis through nutrition assessment. The nutrition intervention consists of two components: planning and implementation.^{88,90} The use of nutrition interventions is determined by the nutrition diagnosis and its cause⁸⁸; for example, the nutritionist may educate a teenage mother on how to breastfeed her infant or iron-deficient pregnant women on how to select iron-rich foods.

The four categories of nutrition intervention strategies that nutritionists can use are as follows⁸⁸:

- *Food and/or nutrient delivery:* This strategy/approach focuses on food and nutrient provision, in the form of meals and snacks, medical food supplements, feeding assistance, and enteral and parenteral nutrition. For example, the nutritionist could provide low-sodium meals to participants in a congregate meal program.
- *Nutrition education:* This strategy is a formal process that instructs or trains individuals in a skill or imparts knowledge to help clients voluntarily manage or modify choices and eating behavior to maintain or improve health. For example, a nutrition professor could instruct dietetic students who are providing nutrition services to athletes on how to

TABLE 1-10 Categories of Nutrition Diagnostic Terminology, Examples, and Applications

Domain	Class	Nutrition Diagnostic Terminology	Example	Application
Intake: Lists actual problems related to intake of energy, nutrients, fluids, or bioactive substances through oral diet or nutrition support (enteral or parenteral nutrition)	Energy Balance: Actual or estimated intake of energy (kilocalories [kcal])	Excessive energy intake	Energy intake that exceeds energy expenditure established by reference standards or recommendations based on physiological needs	May not be an appropriate nutrition diagnosis when weight gain is desired.
	Oral or Nutrition Support Intake: Actual or estimated food and beverage intake from oral diet or nutrition support compared with client's goal	Inadequate oral food and beverage intake	Oral food and beverage intake that is less than established reference standards or recommendations based on physiological needs	May not be an appropriate nutrition diagnosis when the goal is weight loss, during end-of-life care, etc.
	Fluid Intake: Actual or estimated fluid intake compared with client's goal	Inadequate fluid intake	Lower intake of fluid-containing foods or substances compared to established reference standards or recommendations based on physiological needs	Whenever possible, nutrient intake data should be considered in combination with clinical, biochemical, and anthropometric information; medical diagnosis; clinical status; and/or other factors, as well as diet, to provide a valid assessment of nutritional status based on a totality of evidence (Dietary Reference Intakes).
	Bioactive* Substances Intake: Actual or estimated intake of bioactive substances, including single or multiple functional food components, ingredients, dietary supplements, and alcohol	Inadequate bioactive substance intake	Lower intake of bioactive substances compared to reference standards or recommendations based on physiological needs	Bioactive substances are not included as part of the Dietary Reference Intakes; therefore, there are no established minimum requirements or Tolerable Upper Intake Levels. But, dietitians can assess whether estimated intakes are adequate or excessive using the client goal or nutrition prescription for comparison.

			Increased nutrient intake (specify)	Increased need for a specific nutrient compared to established reference standards or recommendations based on physiological needs	Whenever possible, nutrient intake data should be considered in combination with clinical, biochemical, and anthropometric information; medical diagnosis; clinical status; and/or other factors, as well as diet, to provide a valid assessment of nutritional status based on totality of the evidence (Dietary Reference Intakes).
	Nutrient Intake: Actual or estimated intake of specific nutrient groups or single nutrients compared with desired levels	Inadequate fat intake	Inadequate fat intake	Lower fat substances compared to reference standards or recommendations based on physiological needs	May not be an appropriate nutrition diagnosis when the goal is weight loss or during end-of-life care.
	Subclass: Fat and cholesterol	Inadequate protein intake	Inadequate protein intake	Lower intake of protein compared to reference standards or recommendations based on physiological needs	Whenever possible, nutrient intake data should be considered in combination with clinical, biochemical, and anthropometric information; medical diagnosis; clinical status; and/or other factors, as well as diet, to provide a valid assessment of nutritional status based on totality of the evidence (Dietary Reference Intakes).
	Subclass: Protein	Inadequate carbohydrate intake	Inadequate carbohydrate intake	Lower carbohydrate intake compared to reference standards or recommendations based on physiological need	Whenever possible, nutrient intake data should be considered in combination with clinical, biochemical, and anthropometric information; medical diagnosis; clinical status; and/or other factors, as well as diet, to provide a valid assessment of nutritional status based on totality of the evidence (Dietary Reference Intakes).
	Subclass: Carbohydrates and Fiber	Inadequate vitamin intake (specify)	Inadequate vitamin intake (specify)	Lower intake of vitamins compared to reference standards or recommendations based on physiological needs	Whenever possible, nutrient intake data should be considered in combination with clinical, biochemical, and anthropometric information; medical diagnosis; clinical status; and/or other factors, as well as diet, to provide a valid assessment of nutritional status based on totality of the evidence (Dietary Reference Intakes).
	Subclass: Vitamins				

(continues)

TABLE 1-10 Categories of Nutrition Diagnostic Terminology, Examples, and Applications (*continued*)

Domain	Class	Nutrition Diagnostic Terminology	Example	Application
	Subclass: Minerals	Inadequate mineral intake (specify)	Lower intake of minerals compared to reference standards or recommendations based on physiological needs.	Whenever possible, nutrient intake data should be considered in combination with clinical, biochemical, and anthropometric information; medical diagnosis; clinical status; and/or other factors, as well as diet, to provide a valid assessment of nutritional status based on totality of the evidence (Dietary Reference Intakes).
Clinical: Nutritional findings/problems identified as related to medical or physical conditions	Functional: Change in physical or mechanical functioning that interferes with or prevents desired nutritional consequences	Impaired or difficult movement of food and liquid within the oral cavity to the stomach; breastfeeding difficulty	Motor causes (e.g., neurological or muscular disorders, such as cerebral palsy, stroke, and prematurity); altered suck, swallow, breathe patterns	Whenever possible, nutrient intake data should be considered in combination with clinical, biochemical, and anthropometric information; medical diagnosis; clinical status; and/or other factors, as well as diet, to provide a valid assessment of nutritional status based on totality of the evidence (Dietary Reference Intakes).
	Biochemical: Change in the capacity to metabolize nutrients as a result of medications, surgery, or as indicated by altered laboratory values	Changes due to body composition, medications, body system changes, or genetics or changes in ability to eliminate by-products of digestive and metabolic processes	Increased need for a specific nutrient compared to established reference standards or recommendations based on physiological needs	Whenever possible, nutrient intake data should be considered in combination with clinical, biochemical, and anthropometric information; medical diagnosis; clinical status; and/or other factors, as well as diet, to provide a valid assessment of nutritional status based on totality of the evidence (Dietary Reference Intakes).
	Weight: Chronic weight gain or changed weight status when compared with usual or desired body weight	Underweight	Low body weight compared to established reference standards or recommendations	May not be an appropriate nutrition diagnosis when changes in body weight are due to fluid.

<p>Behavioral-Environmental: includes nutritional findings or problems that relate to knowledge, attitudes/beliefs, physical environment, access to food, and food safety</p>	<p>Knowledge and Beliefs: Actual knowledge and beliefs as reported, observed, or documented</p>	<p>Harmful beliefs or attitudes about food or nutrition-related topics</p>	<p>Disordered eating pattern: Beliefs, attitudes, thoughts, and behaviors related to food, eating, and weight management, including classic eating disorders as well as less severe, similar conditions that negatively affect health</p>	<p>Whenever possible, nutrient intake data should be considered in combination with clinical, biochemical, and anthropometric information; medical diagnosis; clinical status; and/or other factors, as well as diet, to provide a valid assessment of nutritional status based on totality of the evidence (Dietary Reference Intakes).</p>
<p>Physical Activity and Function: Actual physical activity, self-care, and quality of life problems as reported, observed, or documented</p>	<p>Impaired ability to prepare food or meals</p>	<p>Cognitive or physical impairment that prevents preparation of foods or fluids; for example, learning disabilities, neurological or sensory impairments, and/or dementia</p>	<p>Whenever possible, nutrient intake data should be considered in combination with clinical, biochemical, and anthropometric information; medical diagnosis; clinical status; and/or other factors, as well as diet, to provide a valid assessment of nutritional status based on totality of the evidence (Dietary Reference Intakes).</p>	
<p>Food Safety and Access: Actual problems with food access or food safety</p>	<p>Intake of unsafe food</p>	<p>Intake of food and/or fluids intentionally or unintentionally contaminated with toxins, poisonous products, infectious agents, microbial agents, additives, allergens, and/or agents of bioterrorism</p>	<p>Whenever possible, nutrient intake data should be considered in combination with clinical, biochemical, and anthropometric information; medical diagnosis; clinical status; and/or other factors, as well as diet, to provide a valid assessment of nutritional status based on totality of the evidence (Dietary Reference Intakes).</p>	
<p>Whenever possible, nutrient intake data should be considered in combination with clinical, biochemical, and anthropometric information; medical diagnosis; clinical status; and/or other factors, as well as diet, to provide a valid assessment of nutritional status based on totality of the evidence (Dietary Reference Intakes).</p>				

Data from: American Dietetic Association. *International Dietetics and Nutrition Terminology (DNT) Reference Manual: Standardized Language for the Nutrition Care Process*, 3rd ed. Chicago, IL: American Dietetic Association; 2011:36–37.

perform skinfold measurements and calculate the percentage of body fat.

- **Nutrition counseling:** This strategy is a supportive process, characterized by a collaborative counselor–client relationship that sets priorities, establishes goals, and creates individualized action plans that acknowledge and promote responsibility for self-care or group care. It treats an existing condition and promotes health. The nutritionist provides direction or advice pertaining to a decision or course of action. For example, the nutritionist could counsel clients with high blood cholesterol on how to select low cholesterol and high dietary fiber foods.
- **Coordination of nutrition care:** This strategy includes consultation with, referral to, or coordination of nutrition care with other healthcare providers, institutions, or agencies that can assist in treating or managing nutrition-related problems. For example, a nutritionist could refer a pregnant teenager to the WIC program.

The nutritionist needs to also apply his or her critical thinking skills to providing appropriate nutrition intervention, including the following⁸⁸:

- Setting goals and prioritizing the nutrition diagnoses based on problem severity, safety, client’s needs, likelihood that the nutrition intervention will have an impact on the problem, and client’s perception of the importance of the intervention
- Defining the nutrition prescription or basic plan
- Making interdisciplinary connections by networking with other professionals such as community nurses, physicians in the community, and others
- Initiating behavioral and other nutrition interventions
- Matching nutrition intervention strategies with client needs, nutrition diagnoses, and client values
- Choosing from among alternatives to determine a course of action
- Specifying the time and frequency of care and nutrition program

Planning the Nutrition Intervention

The process of program planning is discussed in Chapter 12. Community nutritionists need to use assessment data to establish the etiology and signs and symptoms of a nutrition problem (PES) and direct the nutrition intervention at the etiology or cause of the problem identified in the PES statement. For example, an obese teenager *related to* frequent consumption of a large portion of high-fat foods as *evidenced by* a 17-pound weight gain during the last 2 months plus consumption of 1,000 kcal/day more than the estimated needs. In this instance, the intervention would aim at lowering the total fat intake to not more than 30 percent of the

total calories per day plus daily physical activity for at least 30 minutes.

It is crucial that the nutritionist uses evidence-based information to plan the intervention program. **Evidence-based practice** involves using the highest quality of available information to make practice decisions.⁸⁸ The nutritionist using evidence-based information would combine his or her experience with a critical evaluation of primary and secondary sources to support the decision-making process. The AND’s electronic Evidence Analysis Library (<http://www.adaevidencelibrary.com>) contains numerous documents that can support the steps of the NCPM. The AND Evidence-Based Nutrition Practice Guidelines are published in the National Guideline Clearinghouse at <http://www.guideline.gov>.

A **nutrition prescription** is an important part of planning in which the nutrition intervention is specified. It is the community or individualized recommended dietary intake of selected foods or nutrients based on current reference standards and dietary guidelines and the client’s or community’s health condition and nutrition diagnosis.⁸⁸ It is determined using the assessment data, the nutrition diagnosis statement (PES), current evidence, policies and procedures, and client values and preferences, which guide intervention design and monitoring and evaluation plans. The nutrition prescription either drives the selection of nutrition intervention or provides the framework within which the nutrition intervention is implemented. For example, a nutrition prescription for adult men and women attending a nutrition education program for the reduction of cardiovascular disease may be to limit the intake of saturated fat to less than 10 percent of energy intake, trans-fat to less than 1 percent of energy intake, and cholesterol to less than 300 mg/day by choosing lean meats and vegetables and increasing dietary fiber to 25 to 30 g/day. Another example of a nutrition prescription could be a DASH eating plan (the consumption of a diet rich in fruits, vegetables, and low-fat dairy products with a reduced content of saturated and total fat and reducing dietary sodium intake to less than 2.4 g of sodium or 6 g of sodium chloride) for elderly individuals enrolled in a nutrition education program for the reduction of hypertension. A third example is a nutrition prescription for pregnant women 19 to 30 years old participating in a nutrition education program to increase calcium and vitamin D intake to 1½ cups of low-fat milk with morning and afternoon snacks, 1 cup of low-fat milk for lunch, and ½ cup of yogurt with dinner (providing 1,000 mg of calcium and 5 mg of vitamin D from food). A nutrition prescription for breastfeeding mothers less than 18 years old for calcium intake could be 1,300 mg of calcium and 5 mg of vitamin D from food and supplements. Finally, the nutrition prescription for an

intervention program focusing on obese men and women at a worksite may be to consume less than 30 percent of calories from fat and increase physical activity to 30 minutes a day, 5 days a week.

Implementing the Nutrition Intervention

Nutrition implementation is the action phase of the nutrition intervention. The purpose of the nutrition implementation is mainly to correct the nutrition diagnosis, remove the etiology, or reduce the signs and symptoms of the problem. During the implementation of the program, the nutritionist will do the following⁸⁸:

- Communicate the plan of nutrition care or program
- Carry out the plan of nutrition care or the nutrition program
- Continue data collection and modify the plan of care or program as needed

Characteristics that define quality implementation include the following:

- Individualize the interventions to the setting, community, and/or clients
- Collaborate with colleagues and healthcare professionals such as social workers and the local public health department
- Follow up and verify that implementation is occurring and needs are being addressed
- Revise strategies as changes in condition or response occurs

TABLE 1-11 presents specific nutrition intervention areas, definitions, and applications.

The Nutrition Care Process Step 4: Monitoring and Evaluation

The reason for the monitoring and evaluation (M and E) step is to determine whether the goals and expected outcomes were achieved and whether progress was attained in resolving the nutrition problem.⁸⁸ In this step, the nutritionist uses different related nutrition indicators to measure and evaluate the specific changes in the community or client's progress. He or she needs to compare the community or client's previous status and nutrition intervention goals to reference standards (national, institutional, and/or regulatory standards). The nutritionist can measure the outcome by collecting data on the appropriate nutrition indicators and providing evidence that there is a change in behavior or health status. This may include the client's ability to prepare food and meals, portion control, self-monitoring, social support, access to food, and physical activity.

The following is a summary of the three components of the nutrition monitoring and evaluation step:

Monitor progress⁸⁸:

- Check the client's understanding of and compliance with nutrition intervention
- Determine whether the intervention is being implemented as prescribed
- Provide evidence that the nutrition intervention is (or is not) changing the client's behavior or status
- Identify other positive or negative outcomes
- Gather information indicating the reasons for lack of progress
- Support the conclusions with evidence

Measure outcomes:

- Select the nutrition care indicators to measure the desired outcomes
- Use standardized nutrition care indicators to increase the validity and reliability of the measurements of change

Evaluate outcomes:

- Compare monitoring data with the nutrition prescription, goal, or reference standard to assess progress and determine future action
- Evaluate the impact of the sum of all interventions on overall client health outcomes

The following are critical thinking questions that nutritionists can ask during the nutrition M and E step. Did the nutritionist⁸⁸:

- Select appropriate indicators and measures?
- Use appropriate reference standards for comparison?
- Define where the community or clients are in terms of expected outcomes?
- Explain a variance from expected outcomes?
- Determine factors that help or deter progress?
- Decide between discharge and continuation of nutrition care?



Children learn more about nutritious foods when they are involved in meal preparation.

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TABLE 1-11 Nutrition Intervention Domains, Definitions, and Applications

Domains of Nutrition Interventions	Definition	Application
Food and/or Nutrient Delivery	An individualized approach for food and nutrient provision.	Direct food and/or nutrient needs to the PES in the community.
Meal and snacks	The nutritionist may provide meals and/or snacks. Meals are regular eating actions that include a variety of foods consisting of grains and/or starches, meat and/or meat alternatives, fruits and vegetables, and milk or milk products. A snack is food served between regular meals.	A nutritionist may use MyPlate food guidance and the Dietary Guidelines for Americans as a starting point in planning meals and snacks and to promote health and prevent diseases.
Supplements	Foods or nutrients that are not intended as a sole food item or a meal or diet but are intended to provide additional nutrients or to correct a deficiency.	The meal delivery could be in the form of supplements. Collaborate with other healthcare professionals (physicians, nurses, and others).
Enteral and parenteral nutrition	Enteral nutrition is provided through the gastrointestinal tract via a tube, catheter, or stoma that delivers nutrients distal to the oral cavity. Parenteral nutrition is provided intravenously (centrally or peripherally).	In a community setting (home healthcare), a dietitian may review changes in the intervention with the client(s) and/or caregivers and community nurse; may involve change of dressing.
Medical food supplements	Commercial or prepared food or beverages intended to supplement the nutrient intake in energy, protein, carbohydrates, fiber, and/or fat that may also contribute to vitamin and mineral intake.	A nutritionist may provide nutrition education and/or counseling to elderly individuals or children experiencing failure to thrive to increase protein, energy, and fat intake.
Vitamin and mineral supplements	A product that is intended to supplement vitamin or mineral intake.	A community nutritionist may recommend calcium supplements to women at a menopausal education program to reduce the occurrence of osteoporosis.
Bioactive substance supplement	Items that are intended to supplement bioactive substances (e.g., plant stanols and sterol esters, psyllium).	A community nutritionist may recommend an increase in the intake of psyllium to men and women with high blood cholesterol levels that are attempting to reduce cardiovascular diseases.
Feeding Assistance	Assistance in eating for the purpose of restoring the client's ability to eat independently, support adequate nutrient intake, and reduce the incidence of malnutrition, unplanned weight loss, and dehydration.	A community nutritionist may provide meals to elderly individuals who are homebound through the use of a Meals on Wheels program in the community.
Feeding Environment	Adjustment of the physical environment, temperature, convenience, and attractiveness of the location where food is served, which has an impact on food consumption.	A nutritionist may change the high-fat and sugary snacks in vending machines in and around the high schools in the community to include fruits and vegetables to promote health and prevent diseases.

(continues)

Domains of Nutrition Interventions	Definition	Application
Nutrition-Related Medication Management	Modification of a drug or herbal supplement to optimize a client's nutritional or health status.	A community nutritionist may discontinue a dangerous appetite suppressant drug being used by college students in the community.
Nutrition Education	A formal process to instruct or train clients in a skill or to impart knowledge to help clients voluntarily manage or modify food choices and eating behavior to maintain or improve health.	A WIC nutritionist may instruct breastfeeding mothers on how to use a breast milk pump and how to store the milk and prevent spoilage.
Initial/brief nutrition education	Instruction or training intended to build or reinforce basic nutrition-related knowledge, or to provide essential nutrition-related information until the client returns.	A community dietitian may provide nutrition education on how to reduce saturated fat intake to school-age children, college students, and low-income men and women.
Comprehensive nutrition education	Instruction or training intended to lead to in-depth nutrition-related knowledge and/or skills in given topics.	A WIC nutritionist may instruct low-income pregnant women on how to select iron-rich foods at the grocery store.
Nutrition counseling	A supportive process, characterized by a collaborative counselor–client relationship, intended to set priorities, establish goals, and create individualized action plans that acknowledge and promote responsibility for self-care to treat an existing condition and support health.	A community nutritionist may demonstrate how to prepare low-fat meals to older women at a community center to promote health and prevent disease.
Theoretical Basis and Approach	The theories or models used to design and implement an intervention. Theories and theoretical models consist of principles, constructs, and variables that offer systematic explanations of the human behavior change process. For example, Social Cognitive Theory introduces a construct called self-efficacy (confidence in one's ability to do a specific task), which influences the effort a client is willing to expend to achieve a goal. Detailed information about behavior change theories and models is presented in Chapter 13.	A community nutritionist may use games and brainstorming activities to educate elementary school children in how to increase their fruit and vegetable intake.
Coordination of Nutrition Care	Consultation with, referral to, or coordination of nutrition care with other healthcare providers, institutions, or agencies that can assist in treating or managing nutrition-related problems.	A community nutritionist in a local school district may refer pregnant teenagers to the WIC nutritionist, who also refers them to the community center or free clinic for prenatal care.
Coordination of Other Care During Nutrition Care	Facilitating services or interventions with other professionals or agencies on behalf of the client prior to discharge from nutrition care.	A WIC nutritionist may refer homeless individuals to a social worker, a public health nurse, and the Supplemental Nutrition Assistance Program for assistance.

Data from: American Dietetic Association. *International Dietetics and Nutrition Terminology, International Dietetics and Nutrition Terminology (IDNT) Reference Manual: Standardized Language for the Nutrition Care Process*. 4th ed. Chicago, IL: American Dietetic Association; 2013:50-51.

Nutrition Care Indicators

Nutrition care indicators are signs that can be observed and measured and are used to quantify the changes that occurred due to nutrition intervention. The indicators for nutrition monitoring should reflect the community or clients' nutrition diagnosis, etiology, and signs and symptoms. Nutrition care outcomes and indicators include factors that dietetics practitioners can use to make a direct impact on the problem, such as the following⁸⁸:

- Food and nutrient intake; growth and body composition; change in food and nutrition-related knowledge, attitudes, and behaviors; and food access
- Laboratory values, such as HgbA1c, hematocrit, and serum cholesterol
- Functional capabilities, such as physical activity
- Client or community perception of nutrition care and results of nutrition program, such as nutrition quality of life, reduced serum cholesterol, or weight loss

Examples of Monitoring and Evaluation in Community and Public Health

The following are some examples of a nutritionist performing monitoring and evaluation. A public health nutritionist could provide a nutrition and physical activity intervention program to fourth- and fifth-grade obese students after they completed a pretest questionnaire about their exercise and food habits. The nutrition diagnosis was high calorie intake *related to* frequent consumption of high fat from the fast foods served during school lunch and sugary snacks in the vending machines around the elementary school plus lack of physical activity, as *evidenced by* a BMI of 27 and estimated caloric intake of 600 calories per day more than estimated needs. The nutritionist prescribed 30 minutes of daily physical activity and six sessions of nutrition education to the children and two sessions to the parents. Also, homework was given to the parents to carry out with their children, which included exercising with their children and talking about healthy eating during dinner as a family. To monitor the outcome of the program, the parents and the children were asked to keep a 3-day food record, keep a daily log of their physical activity, and complete a posttest. The results of the posttest were compared to the pretest results.

Another example is an overweight 55-year-old woman with high blood cholesterol levels who participated in a community nutrition screening at a local clinic. She had a nutrition diagnosis of high fat intake *related to* daily consumption of high saturated and cholesterol foods,

as *evidenced by* daily consumption of two scrambled eggs for breakfast and a half-pound hamburger 4 times a week, and a serum cholesterol level of 250 mg/dl. The nutritionist implemented a heart-healthy intervention with a nutrition prescription as follows: 25 g/day fiber intake (current is 15 g/day), 30 percent of total calories daily from fat, less than 10 percent of total calories daily from saturated fat, and reduce dietary cholesterol to less than 200 mg/day (current is estimated at 450 mg/day). The nutritionist monitored the intervention by asking the client to keep a record of her food intake and physical activity for 1 week.

Summing up, the NCPM is a tool nutritionists use to communicate nutrition activities within the profession and among a variety of other healthcare professionals.⁸⁸ The model provides a sequence of steps for dietitians to follow and lists essential components in each step of the process. It is helpful in documenting the impact the profession has on specific diagnoses and etiologies in patients/clients or populations. The four steps of the NCPM are nutrition assessment, nutrition diagnosis, nutrition intervention, and nutrition monitoring and evaluation. They are all essential in providing high-quality care to clients and in promoting health and preventing diseases using evidence-based strategies. The NCPM undergoes yearly review modifications. **TABLE 1-12** provides examples of nutrition diagnosis statements and dietary prescriptions.

► The Cooperative Extension System

The Cooperative Extension System (CES) is an agency under the U.S. Department of Agriculture. It provides educational programs that help individuals and families acquire life skills. The mission of the CES is to empower people through education using scientific, research-based information. Typically, land grant universities or colleges help carry out the CES's mission by providing their expertise to county and regional extension offices, which administer these programs. The colleges and universities help the public through informal, noncredit programs. The federal government provides support for the programs through the Cooperative State Research, Education, and Extension Service (CSREES). CSREES supports both universities and their local offices by annually distributing federal funding to supplement state and county programs.⁹⁰

The Morrill Act of 1862 established land-grant universities to educate citizens in agriculture, home economics, mechanical arts, and other practical professions. In 1914,

TABLE 1-12 Examples of Nutrition Diagnosis Statements (PES), Dietary Prescriptions, and Monitoring and Evaluation

Diagnosis/Problem	Standard Phrase	Etiology/Cause	Standard Phrase	Signs and Symptoms	Dietary Prescription	Monitoring and Evaluation
Overweight college students with excessive fat intake	Related to	Frequent consumption of fast-food meals	As evidenced by	60 percent of students having a serum cholesterol level of 250 mg/dl and triglycerides of 165 mg/dl; 57 percent ate half-pound hamburgers and fries 4 times per week, and egg sandwich for breakfast daily. Ninety percent take walks twice per week for 20 minutes, and others do no exercise and smoke two packs of cigarettes a week.	Lifestyle modification: Increase exercise to 30 minutes daily, reduce energy intake, provide meal planning and portion size education, reduce fat intake to 30 percent of total calories, increase fiber intake to 25 or 30 g/day, and decrease dietary cholesterol to 200 mg/day. Refer cigarette smokers to the university health center for counseling.	Select appropriate indicators, such as BMI, serum cholesterol level, Dietary Guidelines for Americans.
Obese high school students with excessive caloric intake	Related to	Frequent consumption of sugary drinks, candies, donuts, and fast food	As evidenced by	Assessments that show 35 percent of the students have a BMI of > 30, and 60 percent consumed 1,000 kcal/day more than estimated needs.	A caloric deficit of 500 to 1,000 kcal/day (energy level varies with the individual's size and activities), fat content of not more than 30 percent of total calories, and increasing exercise to 30 minutes daily.	BMI, Dietary Guidelines for Americans.
Anemic pregnant teenagers enrolled in a WIC program	Related to	Low iron and folate consumption	As evidenced by	An assessment showing Hb of 9 mg/dl, and daily intake of 600 kcal less than the recommended amount.	Increase caloric intake to meet their needs, increase the intake of iron (27 mg/day) and folate (600 µg/day), provide a list containing high-iron and high-folate foods. Vitamin and mineral supplement.	Hb levels, 3-day food records.
Malnourished children in a refugee camp	Related to	Lack of access to food due to political and economic constraints	As evidenced by	Edema of lower extremities, pluckable hair, thin and wasted appearance, low body temperature.	To avoid refeeding syndrome, provide high-calorie and high-protein intake gradually. Provide vitamin and mineral supplements.	Adequate weight and height gain, disappearance of edema of lower extremities.
Elderly women with osteoporosis enrolled in a congregate meal program	Related to	Less than recommender intake of dairy products and vitamin D, and lack of exercise	As evidenced by	Lactose intolerance, low bone density, < 25(OH) D intake, lack of exposure to sunlight, and loss of height.	Increase calcium intake to 1,300 mg/day and vitamin D to 5 µg/day, include weight-bearing exercise for 20 minutes, 3–5 times a day.	3-day food record, bone density measurement

the Smith-Lever Act established a partnership between the USDA and land-grant universities. Currently, CES works in the following six major areas⁹⁰:

- *4-H youth development*: Helps youth make life and career choices. At-risk youth participate in school retention and enrichment programs. They learn science, math, and social skills using hands-on projects and activities.
- *Agriculture*: Helps individuals learn new ways to improve their agricultural income through research-based management skills, resource management, controlling crop pests, soil testing, livestock production practices, and marketing.
- *Leadership development*: Trains extension professionals and volunteers to serve in leadership roles in the community and deliver programs in gardening, health and safety, and family and consumer issues.
- *Natural resources*: Provides educational programs in water quality, timber management, composting, lawn and waste management, and recycling to landowners and homeowners.
- *Family and consumer sciences*: Teaches families and individuals about nutrition, food preparation, positive childcare, family communication, financial management, and healthcare strategies so they can become healthy.
- *Community and economic development*: Helps local governments improve job creation and retention, small and medium-sized business development, effective and coordinated emergency response, solid waste disposal, tourism development, workforce education, and land use planning.

In addition, the Expanded Food and Nutrition Education Program (EFNEP) is a federally funded program designed specifically for nutrition education. The county extension home economists provide on-the-job training and supervise paraprofessionals and volunteers who teach low-income families and individuals about nutrition.⁹⁰ The Successful Evidence-Based Community Strategies features in this chapter discuss the successful Clemson University Cooperative Extension Nutrition Program on low-fat products and fat intake as well as a National Cancer Institute health promotion intervention program.

Successful Community Strategies

The National Cancer Institute's Health Promotion Intervention

Community and public health nutritionists can target worksites as a priority location for intervention efforts. An effective worksite nutrition program must include how to effectively communicate to clients how to choose and prepare foods that follow established dietary guidelines. One example of an effective worksite program is Working Well, which was a randomized worksite intervention trial. This 5-year study funded by the National Cancer Institute (NCI) tested the effectiveness of health promotion interventions directed at individual and organizational changes to reduce employee cancer risk in 57 matched pairs of worksites. Workers and worksites from a variety of geographic and industrial settings were utilized. Four project study centers, a coordinating center, and the NCI collaborated on common elements of design, data collection and analysis, and intervention standards for the common risk factor areas. The All Working Well study centers targeted nutrition and at least one other prevention component (e.g., smoking, cancer screening, occupational health, or physical activity). The study centers were Brown University School of Medicine and The Miriam Hospital (Rhode Island); the University of Florida; the University of Massachusetts Medical School and Dana-Farber Cancer Institute; and the University of Texas M.D. Anderson Cancer Center.

The Working Well intervention was based on a conceptual model that incorporated the following three important elements:

- The use of participatory strategies operated through a primary worksite contact and an employee advisory board
- An ecological approach targeting both individual behavior change and change in environmental and organizational structures
- The use of adult education and behavior change strategies in all aspects of intervention planning and delivery

The nutrition intervention messages are available in a summarized format at <http://nutrition.jbpub.com/communitynutrition>. The messages were translated from nutrient terms into food terminology. They addressed groups of foods that contribute the highest amount of fat and fiber to the U.S. diet. All groups of foods were stated in positive terms.

The intervention was implemented in 114 worksites employing 37,291 workers who were engaged in a variety of businesses. In the fall of 1990, 20,801 respondents completed and returned a self-administered baseline survey. The worksite mean response rate was 71.6 percent. Responses to behavioral items regarding meat were used to measure meat preparation behaviors that could not be obtained from the food frequency questionnaire.

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Successful Community Strategies

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The intervention outcome showed that the average servings of fruits and vegetables per day were less than three in all study centers—2.7 in Florida, Massachusetts, and Rhode Island and 2.4 in Texas. Less than 30 percent of workers in Rhode Island and Massachusetts reported eating beans and lentils at least once per week, and 42 percent in Florida and 56 percent in Texas reported frequent bean and lentil consumption.

From 56 to 64 percent of workers reported eating high-fiber cereal at least half of the time they ate cereal, and 34 to 46 percent reported eating dark bread at least half of the time they ate bread.

The majority of workers reported eating chicken and fish that were not fried (55 to 84 percent), rarely eating visible meat fat (57 to 69 percent), and choosing lean meat (68 to 81 percent). On the other hand, avoiding the skin on chicken was reported less frequently (33 to 47 percent). Avoidance of meat fat was lower in Texas than in the other study sites for all four measures.

With regard to fat in dairy products, 65 to 71 percent drank low-fat or skim milk more than half the time they drank milk. Also, a smaller percentage, 42 to 64 percent, used low-fat cheese or low-fat frozen dairy products. The percentage who used low-fat dairy products other than milk was much higher in the Florida worksite than in worksites at the other study centers. Finally, 46 to 53 percent of subjects used low-fat salad dressing.

Modified from: Hunt MK, Stoddard AM. Measures of food choice behavior related to intervention messages in worksite health promotion. *J Nutr Educ.* 1997; 29:3-11.

Successful Community Strategies

The Clemson University Cooperative Extension Nutrition Program on Low-Fat Products and Fat Intake⁹¹⁻⁹⁷

The percentage of calories from saturated and polyunsaturated fat and the amount of cholesterol in the diet are important determinants of the level of plasma cholesterol, a major contributor to heart disease risk. It is estimated on average that a 1 percent decrease in the intake of saturated fat results in a 2-mg/dl decrease in plasma cholesterol. This, in turn, can bring about a reduction in heart disease risk. High intake of dietary fat is also associated with an increased risk for developing cancer of the colon, prostate, and breast.

Programs that have demonstrated effective community interventions for a decrease in dietary fat include a program from Clemson University in South Carolina, which incorporated community nutrition classes, grocery store tours, speakers' bureaus, professional education classes, home study courses, and worksite nutrition education programs. This program focused on the impact of low-fat diets on serum cholesterol. The intervention community, compared with a control community, had a significant decrease in the intake of dietary fat (9 percent vs. 4 percent) and an increase in awareness of restaurant information (33 percent vs. 19 percent).

In South Carolina, 61 percent of adults were overweight or obese. From 1990 to 2002, the obesity rate among adults in South Carolina increased by 90 percent. The African American, Hispanic, and Native American populations in South Carolina had significantly high prevalence rates of obesity. Approximately 15 percent of South Carolina's high school students were at risk for becoming overweight, and approximately 11 percent were overweight. Data showed that less than 25 percent of all South Carolina's adults and only 18 percent of South Carolina's high school students ate the recommended five or more servings of fruits and vegetables each day. Obesity is associated with many health conditions, some of which include heart disease, stroke, and diabetes. These also make up the three major causes of death and disability in South Carolina. In South Carolina, medical expenditure due to obesity per year was \$1.06 billion.

Clemson's extension agent provided low-fat programs at regional volunteer leader training, an assisted living facility, three community groups, and a summer youth camp. A low-fat nutrition education program was presented to 38 family and community project leaders at regional leader training. These project leaders taught the program to over 400 adult members in their four counties. In addition, the agent taught four 1-hour lessons emphasizing dietary guidelines to a senior group, two adult groups, and a group of young mothers of preschoolers. Also, a 3-hour workshop on nutritious snacks and Nutrition Facts labels was provided to 10 middle school youth. Thirty-two articles on low-fat ideas and nutrition tips were sent to 18 print media outlets in a three-county area (Richland, Lexington, and Fairfield). These print

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Successful Community Strategies

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media outlets reached a circulation of 473,000. The local Fairfield County newspaper (*Herald Independent*) published the nutrition articles 21 times from June 2004 to January 2005. Two Lexington County papers (*Twin-City News and Lexington County Chronicle* and *Dispatch-News*) published the nutrition articles 16 times from April 2004 to January 2005. These three newspapers had a circulation of 19,600 weekly. The state newspaper published three special interviews with the extension agent concerning nutrition information on a vegetable featured in their Life and Style food section. The newspaper had a circulation of 150,000 daily. The Focus on Family Matters quarterly newsletter published nine articles providing research-based nutrition information. The newsletter had a circulation of 1,000 in Lexington, Richland, and Fairfield counties. Nutrition recipe analyses on calories, carbohydrates, dietary fiber, sugar, fat, cholesterol, and sodium were published in the Cook's Corner column of *Living in South Carolina* magazine. The agent analyzed 45 recipes for 11 monthly columns. The magazine had a circulation statewide of 523,000 homes and businesses, with a readership of 1.2 million monthly.

At the end of the extension programs, 89 percent of participants surveyed said that the program had increased their nutrition knowledge. Approximately 72 percent said they would read the Nutrition Facts label on packaged foods. Seventy-five percent said they would reduce their intake of refined sugars. Approximately 78 percent said that they planned to control portion sizes and servings for each food group. Seventy percent said they would include 30 minutes of exercise per day. Sixty-five percent said they would include more whole grain breads and cereals in their diet. Eighty-seven percent said they would make one positive change as a result of the low-fat and healthy ideas programs.

CASE STUDY 1-1: Pregnant Teenagers and Dietary Habits

Beatrice is a community nutritionist (RD) who was employed to provide nutrition education programs to a group of pregnant teenagers attending high school in a Midwestern city of 200,000 people. The teenagers eat most of their meals on campus. Some participate in the school lunch program; others prefer purchasing foods from the vending machine located a few feet away from the cafeteria. Beatrice was asked to help improve the teenagers' nutrition and fitness status. Meetings with the teenagers revealed their opinions about food and physical activity. A 3-day dietary record and food frequency questionnaire were administered to the teenagers, and body measurements, such as height and weight for determining their BMI, were collected. She uncovered the following information:

- Analysis of the teenagers' food choices revealed a high fat intake of 39 percent of total calories.
- Thirty percent of the pregnant teens surveyed were obese (BMI of 30) and anemic, 40 percent were overweight (BMI of 27), and 30 percent were underweight (BMI of 16) and anemic.
- The average hemoglobin level was less than 10 g/dl and hematocrit was less than 35 percent.
- Ten percent of the teenagers had spoon-shaped fingernails on two or three fingers of both hands.
- In the vending machines in and around the high school, 80 percent of snacks were sugary or high-fat foods, such as chips, and they also contained soft drinks or other items with empty calories.
- Further analysis showed that the teen mothers' physical activity levels were inadequate.

The following plans reflect the program Beatrice devised after several meetings with the pregnant teenagers:

- Included fresh fruits and vegetables on every cafeteria menu. (These foods can offer vitamins, minerals, and fiber, as well as decrease the number of high fat items available.)
- Evaluated and found a place where they can perform physical activity and campaigned for needed changes.
- Established a place for physical activity around the teens' homes. (Inactivity is a major contributor to obesity.)
- Collaborated with the school food service director and the vending machine vendors to stock the vending machines with fruits and snacks low in fat and sugar, and to replace sugary soft drinks with fruit juices.

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CASE STUDY 1-1: Pregnant Teenagers and Dietary Habits

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Questions

1. Beatrice is a Registered Dietitian (RD). What are the educational requirements for becoming an RD?
2. Discuss the implications of the high-fat food consumption practices of these teenagers.
3. Some of the participants were anemic. What is the definition of anemia? Why is anemia a deleterious condition during pregnancy?
4. What is the current general physical activity recommendation for the individuals Beatrice is advising?
5. What are the disadvantages of drinking soft drinks (soda)?
6. Why does inactivity contribute to obesity? What are some of the effects of obesity on the health of individuals?
7. What are some of the primary prevention strategies Beatrice used to address the situation?
8. How could Beatrice improve the nutritional status of the students plus reduce their fat intake?
9. How can Beatrice increase the teens' physical activities?
10. In what kinds of settings do community nutritionists work?

Work in small groups or individually to discuss the case study and practice using the Nutrition Care Process chart provided on the companion website. You can also add other nutrition and health-related conditions or assessments to the case study to make the case study more challenging and interesting.

Learning Portfolio

Chapter Summary

- Community nutrition is a modern and comprehensive profession that includes, among other disciplines, public health, dietetics/nutrition education, and medical nutrition therapy.
- The World Health Organization (WHO) defined community as “a social group determined by geographic boundaries and/or common values and interests.” Community members know and interact with one another; function within a particular social structure; and create norms, values, and social institutions.
- A community also can be defined on the basis of a common interest or goal. A collection of people, even if they are scattered geographically, can have a common interest that binds the members together.
- Community strengths can be physiological, psychological, social, or spiritual.
- Community nutrition and dietetics professionals are community and public health agency professionals who provide nutrition services that emphasize community health promotion and disease prevention.
- Public health has been viewed as the scientific diagnosis and treatment of the community. In this vision, the community, instead of the individual, is seen as the patient.
- In addition to dietary factors, two primary determinants of health status are genetics and lifestyle.
- Prevention is important in public health as well as in community nutrition practice. The three aspects of prevention are personal, community-based, and systems-based health.
- The three levels of prevention are primary, secondary, and tertiary prevention.
- Population and individual approaches are the two important strategies to choose from when designing a health promotion campaign aimed at risk reduction. The population approach directs instruction at the whole population or large sections of it, whereas the individual approach identifies those most at risk from the risk factor, and intervention is targeted specifically at these “high-risk” individuals.
- Health promotion can be defined as the process of enabling people to increase control over the determinants of good health and subsequently improve their health.
- In 1978, the WHO and UNICEF held a conference at Alma-Ata, USSR, and declared that health is more than the absence of disease and that the attainment of the highest possible level of health is a vital worldwide social goal.

- In Canada, chronic diseases have common risk factors, including physical inactivity, poor dietary habits, and the use of tobacco. Also, environmental factors such as personal health practices, income, employment, education, geographic isolation, and social exclusion.
- The Leading Health Indicators reflect the major public health concerns in the United States and were chosen based on their ability to motivate action, the availability of data to measure their progress, and their relevance as broad public health issues.
- The negative consequences of nutrition-related problems include malnutrition and chronic health conditions such as obesity, cardiovascular diseases, cancer, diabetes mellitus, and childhood deaths.
- Public health and community nutritionists carry out a wide variety of nutrition activities through various agencies at the local, state, national, and international levels. In most cases, the activities require multi-tasking roles such as blood pressure screening, diet counseling, and medical nutrition therapy.
- Preventive nutrition can be defined as dietary practices and interventions directed toward the reduction in disease risk and/or improvement in health outcomes.
- The Nutrition Care Process and Model (NCPM) contains four separate but interrelated and connected steps:
 - Nutrition assessment
 - Nutrition diagnosis (problems)
 - Nutrition intervention
 - Nutrition monitoring and evaluation
- The Cooperative Extension System (CES) is an agency under the U.S. Department of Agriculture. It provides educational programs that help individuals and families acquire life skills.

Critical Thinking Activities

The working poor (defined as families whose earnings are less than twice the federal poverty level and in which the adults work an average of half time or more during the year⁷¹) are increasing in the current economy. Many public health programs may be eliminated or minimized, such as immunizations for all children and flu shots on demand for all people. Additionally, eligibility criteria for the WIC program may be altered.

- Divide into groups and provide each group a certain amount of money, for instance, \$100,000. Then distribute the funds among the three levels of prevention (primary, secondary, and tertiary) and discuss the rationale behind the decisions. The table below presents examples of programs.

Primary Prevention	Secondary Prevention	Tertiary Prevention
Local Fruits and Veggies—More Matters campaign to schools	Worksite nutrition education for high-risk employees	Medical nutrition therapy for individuals with nutrition-related problems (e.g., heart disease)
School breakfast and lunch	Health Fair screening and referrals to primary care providers	
Breastfeeding support		
Immunizations for all children		
Prenatal care		

- Select four health issues from Table 1-1 and discuss the types of early intervention programs that can prevent the health conditions.
- Divide into groups and determine the locations for the WIC and Supplemental Nutrition Assistance (SNAP) programs in your community. Then, encourage teen mothers to enroll in these programs to obtain adequate prenatal care and nutrition counseling by giving them the addresses of the SNAP and WIC programs and the name of the WIC nutritionist.
- Collect and analyze a 3-day food record from a female high school student and compare the results with a female college student.
- Analyze a school lunch meal and determine the fat, protein, calcium, vitamin D, folic acid, iron, and fiber content.
- Provide a list of foods that are high in iron, calcium, and vitamin D.
- Provide a list of foods fortified with folic acid.
- Provide a list of foods low in saturated fat and cholesterol.

Think About It

Answer: The nutritionist violated the moral virtue of respect. Identify other sources of these vitamins and other actions he could have taken to avoid this violation.

Key Terms

community: A group of people who share a common geographic location, values, culture, or languages.

community nutrition: An area of nutrition that addresses the entire range of food and nutrition issues related to preventing disease and improving the health of individuals, families, and the community.

ethics: The study of the nature and justification of principles that guide human behaviors. They are applied when moral problems arise. Also the science of moral values and a code of principles and ideals that guides action.

evaluation: The systematic comparison of current program results/outcomes with previous status, interventions, goals, or a reference standard.

evidence-based practice: Using the highest quality available information to make practice decisions.

health promotion: The process of enabling people to increase control of and improve their health.

Healthy People Objectives: A tool to help a community create a vision for its future. It is designed to serve as a roadmap for improving the health of people in the United States.

interdisciplinary team: Collaborating personnel representing different disciplines (e.g., nurses, social workers, physicians, daycare workers, dietitians, and dietetic technicians).

nutrition care indicators: Signs that can be observed and measured; they are used to quantify the changes that occurred due to nutrition intervention.

Nutrition Care Process and Model (NCPM): A four-step approach to nutrition problem solving and care that is designed to guide and clarify the work of the nutritionist. It is a standardized process for providing nutrition care.

nutrition counseling: The nutritionist provides direction or advice pertaining to a decision or course of action.

nutrition diagnosis: Determining a nutrition problem that will be resolved with the dietitian's intervention.

nutrition education: A formal process that instructs or trains individuals in a nutrition-related skill.

nutrition implementation: The action phase of the nutrition intervention. The nutritionist carries out and communicates the plan of care/program to the clients.

nutrition intervention: A specific nutrition-related action that resolves a nutrition diagnosis and consists of two components: planning and implementation.

nutrition monitoring and evaluation: A procedure that determines whether the goals/expected outcomes were achieved and whether the nutrition intervention resolved the nutrition problem.

nutrition prescription: Recommended dietary intake of selected foods or nutrients for an individual or a community based on current reference standards and dietary guidelines and the client's or community's condition and nutrition diagnosis

nutritionist: A professional with academic credentials in nutrition; may also be a Registered Dietitian.

preventive nutrition: Dietary practices and interventions directed toward reducing disease risk and/or improving health outcomes.

primary prevention: Activities designed to prevent a problem or disease before it occurs.

public health: The science and art of preventing disease, prolonging life, developing policy, and promoting health through organized community effort.

public health nutrition: Focuses on the community and society as a whole and aims at optimal nutrition and health status. Public health nutritionist positions require dietetic registration by the Commission on Dietetic Registration and a graduate-level science degree that includes study of environmental sciences, health promotion, and disease prevention programs.

Registered Dietitian (RD): A dietitian meeting eligibility requirements (education, experience, and a credentialing examination) of the Commission on Dietetic Registration. Some RDs possess additional certifications in specialized areas of practice, such as diabetes, pediatrics, geriatrics, or renal nutrition.

secondary prevention: Activities related to early diagnosis and treatment, including screening for diseases.

tertiary prevention: Activities designed to treat a disease state or injury and to prevent it from further progression.

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