

CHAPTER TWO

Environmental Influences on the Person and Family

OBJECTIVES

STUDY OF THIS CHAPTER WILL ENABLE STUDENTS TO:

1. Examine the scope of environmental pollution, both outdoors and indoors.
2. Describe the benefits of including human health as a component of environmental assessment.
3. Describe the importance of greenhouse gas emissions.
4. Identify sources of air pollution in your community and specify resulting hazards to human health.
5. List types of water pollution and describe resultant health problems.
6. Determine substances that cause soil pollution and specify their effects on health.
7. Examine types of food pollution and consider their effects on health.
8. Identify sources of noise pollution in various settings.
9. Contrast different types of surface pollution and resultant health problems.
10. Describe health hazards encountered in the home and on the job and the major effects of these contaminants.
11. Analyze ways that you can prevent or reduce environmental, food, and noise pollution.
12. Determine measures of environmental sustainability you can take as a nurse.

13. Evaluate your professional responsibility, in the practice area, in assessing for illness caused by environmental pollutants.

TEACHING–LEARNING STRATEGIES

Teaching–Learning Strategies 1–7. Assign students to use the Internet, newspapers, and local news coverage to explore local, national, and global climate change and environmental pollution.

Two Canadian websites can provide an excellent start to accessing available information on the environment. The Canadian Environmental Directory at <http://circ.greyhouse.ca/page/environment> is Canada's most complete national listing of environmental associations, organizations, and more. Ecoportal Canada (www.planetfriendly.net/ecoportal.htm) is a guide to environmental directories, portals, and networks. These are good starting points to find environmental groups, organizations, and people.

Discuss the interrelationship of pollutants and their effects on humans. Invite local environmental improvement leaders to speak to the class about what has been done and what needs to be done regarding environmental pollutants. What is Health Canada's objective regarding environmental health? Check the Canadian Nurses Association (CNA) website regarding discussion on the environment.

Discuss the three Canadian environmental sustainability indicators of air quality, greenhouse gas emissions, and freshwater quality and their effect on health.

Assign groups of students to use sources of data to conduct a study about one pollutant present in the community. Are there certain times during the year when pollution levels rise and fall? What variables affect this? What are some health problems related to an increase in pollution? What control measures or policies are in place, planned, or desired?

Assign students to research indoor air pollution, including the effects of cigarette smoking, second-hand smoke, the build-up of carbon monoxide, radon, and the “sick building” phenomenon. Discuss ways to monitor and prevent such pollution, and consider how to conduct needed educational programs.

Assign students to conduct a seminar on the effects of air, water, soil, food, sound, and surface pollution on health. Have participants determine suitable health measures to prevent and control pollution. What are some possible evaluative methods to determine the success of designated prevention and control measures?

Explore creative ways that solid and hazardous wastes are being reduced in, for example, recycling of discarded tires, reclaiming of mined land, or using fuel cells to convert chemical energy into electrical energy without creating pollutants. Discuss the impact of these trends on lifestyle. Have students investigate website sources of relevant information. Be sure to urge them to consult academic periodicals in the library. Have them share with the class some of the sources they find. Have them discuss related Canadian research findings.

Food-borne illnesses are common. Have students monitor the local and national media (radio, television, newspapers, Internet) for reports. Discuss the trend toward genetically engineered or altered food and its potential health effects, as well as its effects on agriculture and world hunger. Follow with a class discussion about public responses to pollution and the economic, business, and legal forces that foster, or interfere with, pollution control.

Assign groups of students to conduct research studies in a local hospital(s) on solid waste accumulation. Include such issues as the number of disposable items used, what is done with them after use, the cost of disposable items, and the extent to which nurses are involved in the selection and buying of equipment. Follow with a discussion about the advantages and disadvantages of disposable items used in client care. Have each group share its findings with the class.

Assign students to complete a community assessment utilizing the following form:

Community Assessment

1. Many methods of performing a community assessment are available. The ideal way to assess a community is to walk or drive around it, making notes your impressions. Data may be collected in any of the following ways:
 - A. windshield survey (driving a car, riding a bicycle)

- B. walking (alone or in a group)
 - C. talking to community leaders and residents
 - D. researching census tract data
 - E. reading the local newspaper(s) and telephone book
2. After examining the locale with your own senses, dig deeper and ask questions about the following:
- A. census; population groups
 - B. general economic status; tax base
 - C. residences—architectural style, maintenance
 - D. transportation systems
 - E. highways and access; street maintenance
 - F. educational systems
 - G. proximity of churches, stores, recreational facilities
 - H. air quality
 - I. water quality
 - J. climate
 - K. waste disposal
 - L. noise levels
 - M. health care system, hospitals, and other agencies
 - N. social service and welfare agencies/services

- O. accident statistics
- P. police coverage; lighting
- Q. crime; number of arrests

Teaching–Learning Strategy 8. Discuss some well-known agents in the workplace that affect workers' health. Have the class listen to television or radio, check the Internet, and read newspapers and magazines to learn of other hazardous agents found in occupational settings and in their own community.

Have students visit local industrial plants to observe materials or a specific manufacturing process that may cause health problems. Students can ask the on-site occupational health nurse about prevention measures or devices or screening programs that are being implemented to reduce danger to workers.

The following list provides helpful guidelines to give to students prior to a visit with an occupational health nurse:

Occupational Health Observation

1. Name of occupational setting
2. What is the main purpose of industry, organization, or corporation?
3. Safety program—injury control?
4. Common health problems and/or injuries?
5. Health program for employees? Do the employees have to be hurt or become ill on the job to receive all or part of the service (such as immunization programs, infection prevention, or control measures)?
6. What special or unique services are offered to employees?
7. What, if any, health services are extended to family members?

8. Does this industry liaise with other community agencies?
9. Are **related** health problems—physical and psychosocial—considered? Perhaps additional related problems and concerns could be identified before the visit through discussion in class.
10. What are the duties, qualifications, functions, and responsibilities of the occupational health nurse and of other health workers in the occupational setting? What special knowledge and skills do they require?
11. What legal implications for the nurse, other health care providers, or the occupational setting should be considered?
12. To what extent are records required?

Teaching–Learning Strategy 9. Have students keep a log of the following for one week: (a) food and drink ingested or bought, and what was done with the food/drink containers; (b) cigarettes smoked and where; (c) bathing and laundry practices; (d) automobile usage; and (e) number of hours electric lights and appliances are used daily in the home. Have students analyze ways in which they contributed to the waste of natural resources or to pollution. How do these practices affect systems of self, family, and community? Discuss practices that the student, as a citizen, can use to reduce environmental pollution.

Teaching–Learning Strategy 10. Discuss ways to assess for illness caused by environmental pollutants. Discuss the professional responsibility in health care for those exposed to pollutants. Consider, as well, related federal and provincial or territorial legislative strategies that are either in place or should be in place.

Teaching–Learning Strategy 11. Assign students to note specific characteristics of a therapeutic milieu (physical, emotional, or social) in hospitals or agencies where client care is practiced. Discuss their observations and the nurse's role in maintaining a healthy environment.

Have students list specific measures to foster therapeutic surroundings for the patient during client care experiences. Evaluate the effectiveness of those measures. Have students determine what other options might be possible. Discuss the above in conference, along with the factors

influencing the milieu such as the trends in managed care or administrative personnel and philosophy. Assist students in their clinical experience to establish a therapeutic milieu for their clients.

Have students observe characteristics of the home setting when doing home visits. Is the home safe and comfortable? Is there evidence in the community of environmental hazards such as lead chips, excess noise, contaminated water or food, or air pollution? What measures would improve the setting? Discuss students' observations and have them determine what they can do to improve the setting, if improvements are needed. During this assignment, have students consider teaching principles, culture, socioeconomic level, and other relevant information as mentioned throughout this chapter.

The following list would be a helpful guide to give to students, either prior to the assignment of accompanying a nurse for observation of home care or in working with a client in a home setting:

Student Guide for Observation of Home Visit

1. How was the client referred to the home care agency? What was the purpose of the community health nurse in making this visit?
2. Describe the environmental, social, and economic conditions as you observed them. What relationship might these have to the well-being of the individual and family?
3. How did the client or family seem to feel toward their health and life situation? In what ways did their attitude toward this situation differ from your own concern about it?
4. Describe the relationships of the family group as you observed them.
5. What health conditions were noted in other members of the family? How might these conditions affect the well-being of the individual concerned and the total health of the family system?

6. Has the client (or family) been able to follow health promotion strategies?
7. What nursing care was given? How did this differ from hospital care?
8. What strengths or concerns were presented by the client or the members of the family? What possibilities were expressed for addressing these strengths or concerns?
9. Could the nurse carry out the plan for the visit? If not, why?
10. What plans were made for future visits?
11. If a social worker is active with this family, what are her/his functions?
12. How has this visit affected your understanding of the family?

You may wish to construct similar guidelines for students' observations in any health care setting or agency.

ADDITIONAL INFORMATION

You might find the following sources to be useful references:

1. Environment Canada, *National Pollutant Release Inventory (NPRI)*. Website: www.ec.gc.ca/pdb/npri/npri_home_e.cfm/, accessed November 2008
2. Canadian Nurses Association, *Position Statement: Food Safety and Security Are Determinants of Health*. Website: www.cna-nurses.ca/CNA/default_e.aspx, accessed November 2008.
3. Edwards, Peggy. "Climate change: Air pollution and your health." *Canadian Journal of Public Health* 92, no. 3 (2001), 1–12.
4. Furgal, Chris, and Pierre Gosselin. "Challenges and directions for environmental public health indicators and surveillance." *Canadian Journal of Public Health* 93, Sept–Oct 2002, Supplement 1: S5–8.

5. Hodge, R. Anthony, and J. M. Justin Longo. “International monitoring for environmental health surveillance.” *Canadian Journal of Public Health* 93, Sept–Oct 2002, Supplement 1: S16–23.
6. Gaudry, J. and K. Skiehar, “Promoting Environmentally Responsible Health Care.” *Canadian Nurse*, (2007), 103(1), 23-26.
7. Shah, Chandrakant P. *Public Health and Preventative Medicine in Canada, Fifth Edition*. Toronto: Elsevier Canada, 2003.
8. Government of Canada. *Canadian Environmental Sustainability Indicators*. Ottawa: Author. Catalogue no. 16-251-XIE. 2006.
9. Manfreda, J., M.R. Becklake, M.R. Sears, M. Chan-Yeung, H. Dimich-Ward, H.C. Siersted, P. Ernst, et al. “Prevalence of Asthma Symptoms among Adults Aged 20–40 Years in Canada.” *Canadian Medical Association Journal*, 164, no. 7 (2001), 995–1001.
10. McCarthy, M. J., J. Hansen, R. Herbert, D. Wong, M. Brimacombe, and M. Zelman, “Empowering Parents through Asthma Education.” *Pediatric Nursing*, (2002), 28(5), 65–73.
11. Frank, J. “CIHR Research: Catching Your Breath: Research Efforts to Analyze the Negative Effects of Air Pollution on Human Health.” *Healthcare Quarterly*, (2006), 9(4), 18–20.
12. Mehdi, B. (Ed). *Adapting to Climate Change: An Introduction for Canadian Municipalities*. Canadian Climate Impacts and Adaptation Network (C-CIARN), 2006.
13. Pike-MacDonald, S., D. G. Best, C. Twomey, L. Bennett, and J. Blakeley. “Promoting Safe Drinking Water.” *Canadian Nurse*, (2007), 103(1), 15-19.
14. A video on accident prevention could be related to the chapter content, followed by a discussion of accident proneness and examples of safety measures in the home or work setting.

Discuss the increasing awareness of the health effects of excessive computer use on all ages—both at home and in the workplace. Consider and identify a few of the most relevant health promotion strategies.

CHAPTER 2 TEST QUESTIONS

The correct answer to each test question is filled in or indicated by an asterisk (*).

Matching: Place the letter from Column B to the left of the appropriate term in Column A.

Column A	Column B
<u>B</u> 1. Hypoxia	A. Natural radioactive gas that causes indoor air pollution.
<u>C</u> 2. Suspended particles	B. Decreased blood oxygen resulting from air pollution.
<u>A</u> 3. Radon	C. Extremely small bits of dust, ash, dirt, or aerosols that irritate mucous membranes.
<u>E</u> 4. Pesticides	D. Unwanted amounts of sound that produce temporary or permanent effect.
<u>D</u> 5. Sound overload	E. Substances that kill insects, weeds, or vermin.
<u>G</u> 6. Decibels	F. Discarded material that poses a threat to human health or the environment.
<u>F</u> 7. Hazardous waste	G. Measurement of sound loudness.
<u>H</u> 8. Pica	H. Regularly eating non-food substances.
<u>J</u> 9. Therapeutic milieu	I. Agent that causes malformation.
<u>I</u> 10. Teratogen	J. Environment that focuses on staff characteristics and promoting patients' security and comfort.

Multiple Choice: Select the *best* answer. The asterisk (*) indicates the *best* answer.

1. Understanding environmental concepts is important in health care because:
 - A. the assessment of the client may be more precise
 - B. the client's behaviour is influenced by environmental experiences
 - C. diseases are seldom caused by environmental conditions
 - D. expectations of care vary with the environment

a. A and D b. B and C *c. A, B, and D d. A, B, C, and D

2. Environmental sources of health problems may include:
 - A. pesticide or antibiotic residues in food
 - B. air pollutants from automobiles and industry
 - C. natural radioactive substances in soil
 - D. chemicals and organisms found in water

a. B b. C and D c. A, B, and D d. A and C *e. A, B, C, and D

3. Water pollution:
 - A. affects primarily wildlife and natural water areas
 - B. is primarily an aesthetic problem
 - *C. affects all organisms and the food web
 - D. has little effect on health

4. The emphasis of the Canadian Environmental Protection Act (CEPA), designed to protect the environment and human health, is based on:
 - A. the effective management of pollution
 - B. frequent analyses of the effects of pollution
 - *C. the prevention of pollution
 - D. the effective disposal of the results of pollution

5. Eight-year-old Ronnie Hall experiences recurrent episodes of coughing, wheezing, breathlessness, and chest tightness. What are the most common precipitating factors for these events?
 - *A. airborne allergens, environmental irritants, and respiratory viruses
 - B. allergens, environmental factors such as smoke, and non-steroidal anti-inflammatory medications
 - C. allergens, specific medications, stress, and sudden increased activity level
 - D. all allergens, occupational pollution, foods, and indoor chemicals

6. Effects of dioxin toxicity may include:
 - A. some types of cancer
 - B. reduced immune response
 - C. liver damage
 - D. birth defects

a. A and B b. B, C, and D c. C and D *d. A, B, C, and D

7. The effects of food additives:
- A. may lead to malnutrition
 - B. are unlikely to be serious
 - C. are found only in animal populations
 - *D. are evaluated legally for toxicity
8. Noise pollution has which of the following effects?
- A. impaired communication
 - *B. increased hearing acuity
 - C. depression
 - D. fatigue
9. The effects of sound overload may include which of the following?
- A. headache, fatigue
 - B. tinnitus, hearing loss
 - C. increased concentration
 - D. irritability and insomnia
- a. A and B b. B and C *c. A, B, and D d. A, B, C, and D

10. Measurements to decrease the risks of hearing loss from sound pollution include:

- A. the use of sound-absorbing materials in the home or workplace
- B. alternate sound to “drown out” unwanted noise
- C. the use of protective ear coverings only if sound overload is physically uncomfortable
- D. the realization that sound overload is unlikely to cause ear injury

*a. A b. A and D c. B, C, and D d. A, B, C, and D

11. Symptoms of sick building syndrome may include:

- A. headaches, dizziness, mental fatigue
- B. irritation to mucous membranes
- C. respiratory infections
- D. gastrointestinal upset

a. A and C b. A and D *c. A, B, and C d. B, C, and D

12. Sick building syndrome, pesticide toxicity, dioxin toxicity, and sound overload may all produce similar effects in humans, including which of the following?

- A. neurological symptoms
- B. behavioural changes
- C. cognitive changes
- D. physical appearance changes

a. A and B b. C and D c. A, C, and D *d. A, B, C, and D

13. Pica would be a likely condition if which of the following were present?
- A. The person came from a culture where pica has been traditionally practiced.
 - B. The person stated that she felt a craving for cornstarch, refrigerator frost, putty, or a specific clay.
 - C. The person showed signs of malnutrition but stated she was not hungry.
 - D. The person seemed indifferent to discussions of adequate nutrition.
- a. A b. B and C *c. A, B, and C d. B, C, and D
14. Common hazards in the workplace include:
- A. biological or infectious agents
 - B. chemical agents
 - C. mechanical demands
 - D. physical stressors
- a. A and C b. A and D c. A, C, and D *d. A, B, C, and D
15. Components of any therapeutic milieu include which of the following?
- A. a clean, safe physical environment
 - B. decorative, aesthetically pleasing surroundings
 - C. an authoritarian organizational hierarchy
 - D. collegial interpersonal relations
- a. A and B b. B and D *c. A, B, and D d. A, B, C, and D

16. Some of the following understandings will help you to promote a therapeutic milieu for a client. These understandings include the realization that:
- A. relationships between members of the health team influence the milieu and health care
 - B. the physical and aesthetic environment affects the client's comfort and recovery
 - C. personnel and patient policies affect milieu and therefore client welfare
 - D. routines should be adopted with the staff's needs primarily in mind
- a. A and B *b. A, B, and C c. A, B, and D d. A, B, C, and D
17. For society, the best way to manage waste is to incorporate the following four Rs:
- *A. reduce, reuse, recycle, and recover
 - B. reuse, reduce, recycle, and recover
 - C. recycle, reuse, reduce, and recover
 - D. reduce, recycle, reuse, and recover
18. Your friend graduated as a nurse and is presently searching for a position in a hospital. Which factors should she be specifically aware of in order to discuss her risk of injury?
- A. adequacy of equipment
 - B. maintenance of workplace
 - C. educational resources
 - D. adequacy of staff
- a. A and B b. A and D *c. A, B, and D d. A, B, C, and D

19. New and re-emerging diseases are increasingly common in some regions because:
- A. global travel has increased
 - B. general resistance to antibiotic therapy has decreased
 - C. population growth has outpaced supplies of clean water
 - D. the implementation of public health measures has increased
- *a. A and C b. A, B, and C c. B, C, and D d. A, B, C, and D
20. Conservation measures that can be practiced by the citizen/professional include:
- A. the reduction of energy use
 - B. the conservation of water supplies
 - C. using toxic substances sparingly, if at all
 - D. buying products that can be recycled
- a. A and D b. B and C c. A, B, and D *d. A, B, C, and D