

CHAPTER 1



Introduction

Chapter Outline

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- Definitions of Environmental Health
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Learning Objectives

On completion of this chapter, the reader should be able to:

- Define environment.
- Describe the areas and components of environment.
- Explain the importance of healthy environment.
- Discuss the environmental problems.
- Enlist the factors affecting environmental health.
- Explain the programs and efforts for environmental protection.
- Describe environmental pollution.
- State the hazards of environmental pollution.
- Discuss climate change and its effects in India.
- Practice the means of conservation of environment.
- Appreciate the role of nurses in climate change.

Key Terms

- **Deforestation:** Removal of trees and forest from a place.
- **Environment:** Factors affecting person's life.
- **Greenhouse:** Gradual rise in temperature of earth's atmosphere caused by increased carbon dioxide.
- **Green revolution:** Increasing crops by using fertilizers.
- **Pollutant:** A substance that pollutes.
- **Pollution:** Presence of impurities.
- **Sanitation:** A system that dispose human waste efficiently protecting health.
- **Urbanization:** Development of rural areas like cities.

INTRODUCTION TO ENVIRONMENT

Environment today has become a multidisciplinary subject. In earlier days, it was studied as a branch of natural science but nowadays it is related with social sciences, history and literature. According to the system theory of environment, it refers to the internal environment and external environment. The internal environment includes biological, physical, psychological, sociological and spiritual systems. The external environment consists of all external factors, living and nonliving that surround the human beings and affect them such as air they breathe, water they drink, the food they consume, housing, climate, heat, radiation, humidity geography, waste, microbial agent, insects animals, rodent, plants and noise, automobiles, etc. The key to the good health largely depends upon the healthy environment. The much of the health problems are due to adverse environmental factors such as water pollution, air pollution, poor housing conditions, presence of animal reservoirs and insects, vectors of diseases, which pose a constant threat to human health. The environment is getting deteriorated very fast because of population explosion, growing industrialization, increasing urbanization, deforestation, soil erosion, continuous nuclear technology and green revolution, etc.

In earlier days, the environmental sanitation was used to determine the relation between environment and health. The word sanitation means the science of safeguarding health; a way of living cleanly in all aspects of life, on the basis of which one can protect himself against disease and improve health. Cleanliness and hygienic conditions essential for good health are related to healthy environment. The health and environment have deep interrelation. Actually the term sanitation covers the whole field of controlling the environment with a view to prevent disease and promote health. Man has already controlled some factors in his environment, e.g., water, housing, food, clothing and sanitation. These controllable factors are included in the standards of living. It is the control of these factors that are responsible for improvement in human health in the past century in developed countries. As the old problems are solved, new problems are emerging due to deleterious changes in the environment as a result of fast development, industrialization and urbanization and demographic growth, so man is responsible for the pollution of his environment. Every change in environment affects the health. Clean and safe environment can be the basis of good health. There is a wide spread concern among the general public health engineers, environmentalist, scientist, health administrators, epidemiologist, health professional and politicians, etc. Environmental degradation is of growing concern of international agencies like United Nations and World Health Organization. In 1972 (UN conference on human environment focused the attention of whole world on the environmental hazards that threaten human being, since then World Environmental Day is celebrated on 5th of June every year to act as a reminder on the persisting environmental problems.

DEFINITIONS OF ENVIRONMENT

“It is defined as all that which is external to the individual and with which he is in constant interaction”. It includes all external surroundings such as housing, air, water, food, soil, plants, animals, insects, microbes, etc. It also includes meteorological factors such as, temperature, humidity, sunlight, rainfall, etc.

“Environment is the sum total of all conditions, effects and system, which affect all creatures, their racial development, life and death.”

—**Universal Encyclopedia**

“Environment refers to the sum total of conditions which surround a man at a given point in space and time”.

—**Chris Park**

“Environment indicates all of the internal and external conditions, circumstances and influences surrounding or affecting the development and behavior of persons and groups”.

—**Roy (Nursing Theorist)**

“Environment is the sum total of all external conditions and influences of the development cycle of biotic elements over the earth’s surface”.

—**Herskovits**

SANITATION

The literal meaning of sanitation is, “the science of safeguarding health”. Sanitation is considered as a way of life by National Sanitation Foundation of USA. It defines sanitation “as the quality of living which is expressed in the clean home, the clean farm, the clean business, the clean neighborhood and the clean community, it is nourished by knowledge and grows as an obligation and an ideal human relations.”

Being a way of life, it must come from within the people. In the past, sanitation was focused on the sanitary disposal of human excreta. Even today also many people think that sanitation means the construction of latrines. Actually the term sanitation includes the whole field of controlling the environment.

ENVIRONMENTAL SANITATION

It is defined by WHO as “The control of all those factors in man’s physical environment which exercise or may exercise a deleterious effect on his, physical development, health and survival”.

Sanitation or environmental sanitation is no more only concerned with sanitary disposal of human excreta but covers the whole field of controlling this environment in order to prevent and control diseases and promote health. It includes prevention of pollution of environment from industrial wastes, automobiles, nuclear technology, pesticides, etc. Therefore, the term environmental sanitation is replaced by environmental health.

ENVIRONMENTAL HEALTH

It can be defined as, “an art and science of promoting positive environmental factors and prevention and control of all the potential hazards including physical, chemical, biological and social factors which have deleterious effect on health of people”.

Historical View

The relationship of the environment to health has been recognized by nurses since the time of Ms Florence Nightingale. She was the first nurse to recognize the importance of environmental factor in relation to health. Her concept of nursing care focused strongly on modifying the physical environment and included the “five essential points”, i.e.

1. Pure air
2. Pure water
3. Effective drainage
4. Cleanliness
5. Light.

Thousands of years before the Christian era (3000–1500 BC), The Indus Valley Civilization showed the presence of planned cities with sophisticated drainage and water supply system, well-developed houses and public baths suggesting the practice of environmental sanitations.

During the same period environmental sanitation measures were taken by Egyptian and Romans. In India, sanitary condition deteriorated during the Mughal Empire.

The outbreak of leprosy and bubonic plague during 13th and 14th century in European countries was associated with poor environmental sanitation.

The movement of true healthful living started during the middle of 19th century in the European countries and America.

The impact of environment on health was first documented by Edwin Chadwick in 1842 in a report on sanitary condition of laboring populations of Great Britain. In 1850, John Snow documented the spread of disease due to contaminated water in London for the first time even before the discovery of microorganisms.

Later on because of the discovery of bacteria by Louis Pasteur and Robert Koch, the role of bacteria and environment in disease causation was understood, since then lot of efforts have been put in and measures have been taken by the Government at all levels in European countries and in America to assess, prevent and correct environmental hazards to promote health and prevent disease.

In India in 1859, Ms Florence Nightingale was involved by the British Parliament to investigate the heavy morbidity and mortality of British soldiers. Poor environmental sanitation was found to be associated with prevailing sickness among military and civil population, since then the emphasis was put on improving the sanitary conditions through public health department, local municipalities and health education department.

In India, after independence various specific programs for improvement of environmental sanitation have been implemented through community development programs in rural and urban areas. National Water Supply and Sanitation Program was started in 1954.

A drinking water board was set up in 1963, some acts were enacted and promulgated and included:

- Comprehensive Water (Prevention and Control of Pollution) Act in 1974.
- The Air (Prevention and Control of Pollution) Act, 1981.
- An Environmental Protection Act in 1986.
- Prevention of Food Adulteration Act, 1975.

In spite of all these efforts, the environment is getting polluted because of manmade pollutants like toxic gases, chemicals, radiation, nuclear waste, domestic and industrial waste are continued to be released in water, air and soil.

DEFINITIONS OF ENVIRONMENTAL HEALTH

“The control of all those factors in man’s physical environment which exercise or may exercise harmful effect on his physical development, health and survival.” —WHO

“All external conditions and factors which influence the living organism, human behavior and the life and development of society is called the environmental health.” —Dr Ghosh

All the external elements living or nonliving material surrounding man constitute environment. The health of man is influenced by every change in environment conditions. Clean and safe environment is the basis of good health. The physical factors like air, water, light, soil, food, housing, climate, radiation and sound, etc. are in touch with a person for all his life and has direct effect on his health, development and life expectancy. The good physical environment is essential for good health. The biological environment like bacteria, virus, plants, animals, insects, rodents, parasites and microbes are related to the health of a person.

AREAS OF ENVIRONMENT

The nature of environment is ever changing. The areas which can be included in the study of environment are as under:

- Ecological system
- Spatial system and analysis
- Study of biosphere
- Study of natural disasters
- The development of scientific forecasts of anthropogenic changes in the environment.

Although, the current concept of health and the environment are more complex but nursing continues to be concerned with human beings interaction with the environment in care and research. Providing an optimum environment for the maintenance of wellness is the responsibility of nursing personnel.

COMPONENTS OF ENVIRONMENT

There are three main components of environment, which are closely related to one another. These are as follows:

1. Physical environment
2. Biological environment
3. Social environment

Physical Environment

It is concerned with nonliving things and variety of physical forces and factors which directly or indirectly regulate the body mechanism and affect the health of the people. The physical environment includes housing, water, air, soil, lighting, friction, radiation, heat, sound, gravity, humidity, wind velocity, climate, geography and electromagnetic field, etc. The variety of pollutants are found to pollute air, water, soil, food and result into various acute and chronic diseases, e.g., gastrointestinal, respiratory and skin diseases.

Biological Environment

Biological environment comprises of all living things around man. Biological environment includes animals, plants, birds, insects, rodents, bacteria, virus, fungi, protozoas and other microorganisms. There are some diseases which are produced by arthropods, insects, microorganism, domestic and wild animals. Most of the time, there is harmonious coexistence but sometimes this is disturbed and results into ill health.

Social Environment

The social environment includes customs, culture, belief, moral and ethical values. Income, education, social rules and regulation, religious practices, habits and occupation and living standards of the people. A favorable social environment helps individuals in their social development and maintenance of social health. The individual develops certain practices which will have positive and negative social impact. Some of the negative social practices which have negative effect on health are purdah system, early marriage, dowry system, low status of women, caste system and segregation, etc. Some of the social condition which also have negative impact on health are broken families, single parent family, over population, large families, poverty, illiteracy and unemployment, etc.

All these components of environment are related to each other. Every component of environment can help people to develop their potentialities to maximum and to attain optimum health.

IMPORTANCE OF HEALTHY ENVIRONMENT

Healthy environment is important for:

- Improving the health status of the individuals and community
- Protecting the population against diseases
- Controlling the environmental pollution
- Protecting the people from environmental hazards
- Reducing the morbidity and mortality
- Protecting against communicable and noncommunicable diseases
- Encouraging environmental education
- Protecting the health of individuals and communities
- For improving the social status of the people
- For the development and progress of the country and nation.

PURPOSE OF ENVIRONMENTAL HEALTH

The purpose of environmental health is to create and maintain ecological conditions that will promote health and thus prevent diseases.

Members of environmental team are:

- Public health engineer
- Epidemiologist
- Physician trained in public health
- Sociologist
- Economist
- Public health nurse or community health nurse
- Health inspector

- Town planner
- Auxiliary staff.

ENVIRONMENTAL PROBLEMS IN INDIA

- Air and water pollution
- Reduction in forest area
- Soil erosion
- Sound pollution
- Poor housing and slum development
- Excessive use of chemicals, fertilizers in agriculture leading to soil pollution
- Industrialization and urbanization
- Unhygienic disposal of human excreta and refuse
- Insects and rodents
- Increasing pressure of traffic
- Depletion of natural resources
- Threat to biodiversity
- Radiation hazards
- Population explosion.

FACTORS AFFECTING ENVIRONMENTAL HEALTH

The environment in which we live is constantly deteriorating due to various factors, i.e. man-made and natural, some of the natural factors are transient and seasonal, e.g., floods and droughts, etc. There are number of man-made and natural factors, which are making the environment unhealthy by affecting our ecosystem and environmental health. These factors are:

- **Population explosion:** Population explosion is the biggest problem. Population of India is increasing very rapidly and creating problems due to overcrowding, development of man-made resources by urbanization and industrialization and green revolution.
- **Urbanization:** People are migrating to urban areas for education, employment opportunities due to industrialization in the cities, they get jobs, as in the villages facilities for education and employment are lacking. People are poor in the villages and they migrate to cities for their livelihood resulting in overcrowding and development of slums, mostly on unauthorized land.
- **Automobiles:** The increasing motor vehicles and other automobiles results not only is overcrowding of the roads but the exhaust they release contains number of harmful gases and other particles which fell upon human health. The exhaust of automobile released contains carbon monoxide, nitrogen oxide, lead and other unburnt hydrocarbons, which pollute the air we breathe and causes various respiratory disease. Though the automobiles save time and energy but their hazards are dangerous to health.
- **Industrialization:** After independence, the industrialization has increased tremendously. There are small scale as well as large scale industries in towns. The industrial waste contains harmful waste products such as gases, solid material, effluents, thermal waste, fumes of acids from acid factories and various chemicals are released into the atmosphere. These industrial wastes other than releasing into the air, it is also thrown into the rivers and streams, drains and on the land. It not only pollutes air, but water and land too, thus deteriorate our environment causing harmful effect to the human health as well as to the animals and plants also.
- **Deforestation:** Deforestation is another biggest threat to the environment pollution. The trees release oxygen and take up carbon dioxide from the atmosphere there by purifying air. They also

transfer water from ground to the air thus maintaining temperature and also prevent soil erosion. But forests are being removed for need of wood for housing, building, industries and expansion of land due to increased population, modernization, urbanization, colonization and industrialization. This phenomena is causing change in the climate and have adverse effect on environmental health.

- **Green revolution:** The use of excessive fertilizers for increasing the yield of crops demand excessive water and as a result the underground water is diminishing. It is causing threat to water requirement for human being and animals. The farmers are using excessive insecticide to destroy the pests and microorganisms, which have lasting effects on the agricultural products through food chain. These products are passed onto the various animals and human beings and cause various disease, e.g., cancer is one of the disease which is found in the areas where excessive chemical, fertilizer and insecticides are used.
- **Radioactive substances:** The power plants and hospital laboratories where the radioactive substances are used, if the human being working in such places do not take proper precaution and are exposed to the radioactive elements like radium, uranium, which emit radiation. This radiation causes cancer of various organs. The radioactive wastes from the power plants if not disposed safely with special disposal methods, it pollutes air and water and causes harmful effects on all living things, human being, plants and animals.
- **Natural calamities:** These are not man-made, these include floods, droughts, earthquakes, cyclones, volcanoes, landslides, tidal waves and tsunamis in the sea. All have harmful effect directly or indirectly on human being, plants and animals.

PROGRAMS AND EFFORTS FOR ENVIRONMENTAL PROTECTION

To protect the environment, the remedial and preventive measures are needed. The methods and programs have been adopted to protect the environment are listed as under:

- **Environmental education:** Providing education and information to the communities about the importance and need for environmental protection
- Encouraging the plantation of trees and gardens
- Prevention of deforestation and soil erosion
- Strengthening the central pollution control board
- Ensuring the supply of lead free petrol and improving the quality of diesel or using alternative fuel, e.g., CNG
- Protecting the barren land and using it for tree plantation
- Protecting islands
- Paying attention to the projects related to the control and protection against industrial pollution
- Making and developing the environmental statistics, charts and maps
- Emphasizing the setting up of common effluent treatment plants
- Using clean technology in small scale industries
- Protecting the Himalayas, Taj Mahal and other objects of historical and natural importance from environmental pollution
- Keeping record of natural resources
- Assessing the effects of environment
- Surveillance and monitoring system for environmental pollution
- Survey and protection of biodiversity
- Procuring international help for environmental protection.

ENVIRONMENTAL POLLUTION

Environmental pollution means “an imbalance in the constituents of environment”. This imbalance may be air pollution, water pollution, sound pollution, radiation, soil pollution and soil erosion. The causes of environmental pollution may be increasing level of carbon dioxide, improper drainage or sewage system, spreading of smoke in the air, radioactive materials and insecticides, etc.

Pollution

Pollution is the effect of undesirable changes in our surrounding that have harmful effect on plants, animals and human beings.

Definitions of Pollution

- Pollution is the co-product of the human activities which causes harm to the environment. —**Webster Dictionary**
 - Pollution indicates unwanted impurities, which are found in the environment. —**M. Walter**
 - Pollution is an undesirable change in the physical, chemical or biological characteristics of our air, land, water that will harmfully affect human life, our industrial process, living conditions and cultural assets or deteriorates our raw material resources. —**E. P. Odum**
- Thus, we can say that pollution refers to the waste of human activities and adverse effects of their disposal in the environment. It causes harm to the human beings, animals and plants.

Pollutant

Pollutant is a waste material that pollutes air, water or soil. It is an unwanted substance that occurs in the environment usually with the health threatening effects. Pollutants can be classified into the following:

- From an ecological point of view it is categorized into three groups:
 - (i) **Degradable pollutants:** These pollutants can be rapidly broken down by natural processes. These include discardable vegetables and domestic sewage.
 - (ii) **Slowly degradable pollutants:** These pollutants remain in the environment for many years in an unchanged condition and take longer time to degrade, e.g., DDT and plastic materials.
 - (iii) **Nondegradable pollutants:** These pollutants cannot be degraded by natural processes. These include toxic substances like lead, mercury and nuclear waste, etc.
- From the general point of view, these are also classified into three groups:
 - (i) **On the basis of origin:** These include natural pollutants and man-made pollutants.
 - (ii) **On the basis of nature form:** These include solid waste, liquid waste, gaseous waste, thermal waste, sound waste (noise).
 - (iii) **On the basis of visibility:** These include visible pollutants, e.g., dust, dirt, fog/smoke (smog) garbage, sewage and nonvisible pollutants include chemicals in water and soil and micro-organisms.

Sources of Pollutants

It can be:

- **Natural sources:** In this group the pollutants are released during natural activities or disaster, earthquakes, drought, floods, landsliding, cyclones and ash of volcano, etc. are responsible for producing natural pollutants.

- **Human sources:** This group includes man-made pollutants. These are:
 - ♦ Domestic effluents
 - ♦ Sewage
 - ♦ Agricultural effluents
 - ♦ Combustion process
 - ♦ Industrial effluents
 - ♦ **Waste:** Domestic, mining, municipal and biomedical waste, etc.
 - ♦ Radioactive waste
 - ♦ Transportation and social activities.

Forms of Pollution

There are three main forms of pollution:

1. **Physical or natural pollution:** It includes air pollution, water pollution, soil contamination, sound pollution, light pollution, thermal pollution, radioactive contamination and visual pollution.
2. **Socio-cultural pollution:** It includes economic pollution, i.e. poverty and unemployment, political pollution (war) religious pollution (communal riots), social pollution (crime, dacoity, etc.), cultural pollution (moral crisis).
3. **Regional pollution:** It includes:
 - Rural pollution
 - Urban pollution
 - Agricultural pollution
 - Industrial pollution

Hazards of Environmental Pollution

Hazards due to Air Pollution

The air polluted with smoke, toxic gases and fog causes asthma, TB, cough, infections of respiratory tract.

Hazards due to Water Pollution

Unsafe water supply, mixing of sewage in drinking water or using impure water of ponds, lakes and rivers causes water borne diseases such as diarrhea, dysentery, cholera, typhoid and gastroenteritis, etc.

Malnutrition Hazards

The economic pollution or poverty causes malnutrition in children and women. The malnourished children are easy victims of infections and may get diarrhea, measles, TB, marasmus, kwashiorkor.

Agricultural Hazards

- Excessive use of chemical fertilizers, insecticides leads to toxicity of skin and lung disease
- Accidents caused by agricultural machinery, i.e. tractors, tools and equipment
- Worm infestations and tetanus, etc. due to pathogens residing in soil and floor
- Reduction in the nutritive values of agricultural products due to use of injudicial use of chemical fertilizers. It causes intestinal diseases. Infections of intestine by consuming vegetables irrigated with untreated water.

Traffic Hazards

The traffic pollution causes number of accidents:

- **Road accidents:** Poor condition of roads faulty engineering of roads, not obeying traffic rules, poor lighting, behaviors of traffic police and stray animals on the rounds, etc. are the causes of road accidents.
- **Rail accidents:** Human errors, terrorist activities, carelessness, outdated signaling system, unmanned crossing has increased the number of rail accidents.
- **Air accidents:** Use of outdated planes, unskilled operators, bird strikes, improper training, manufacturing defects, bad weather are the major causes of air accidents.

Industrial Hazards

- Environmental pollution affects the health of the workers
- Skin and respiratory problems due to industrial dust and fumes
- Accidents caused by unprotected parts of the machines, chemicals and electricity, etc. Inadequate lights, sound pollution or falling from a height
- Mental tension due to managerial faults, labor unrest and not providing sufficient attention to labor welfare programs
- **Climate change:** Climate change is the change of weather over a period of time that may range from decades to millions of years. The main cause is rise in atmospheric temperature due to number of man-made activities and natural calamities.

CLIMATE CHANGE

Climate change is a change in the statistical distribution of weather over a period of time that may range from decade to millions of years. It may be a change in the average weather or in the distribution of weather. Climate change may be limited to a specific region or it may be across the whole earth.

Definitions

- Climate change is a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variably observed over comparable time period. —UNFCCC
(United Nations Framework Convention on Climate Change)
- Climate change is a change in the statistical properties of the climate system when considered over period of decades or longer, regardless of cause. —Popular General Definition

FACTORS AFFECTING CLIMATE CHANGE

Factors that can change climate are called as climate forcing. Some of the factors are given below:

- Change in greenhouse gas concentration
- Variation in solar radiation
- Depletion of ozone layer
- Emission of carbon dioxide from fossil fuel combustion
- Deviation in the earth's orbit
- Mountain building and continental drift
- Cement manufacturing

- Deforestation
- Agricultural activities
- Industrialization
- Human activities

Impact of Climate Change in India

- Decreased snow cover, affecting snow belt and glacial system such as Ganga and Brahmaputra. 70% of the summer flow of the Ganga's come from melt snow
- Drop in wheat production by 4–5 millions of tones with even a 1°C rise in temperature
- Unpredicted heat waves and cyclone
- Effect on fisheries and human health
- Effect on livelihood based on forest products
- Increased chance of floods and disrupting human life
- Rising sea level causing displacement along one of the most densely populated coastlines in the world, threatened freshwater sources and mangrove ecosystems
- Change in density and type of India's forests which may affect 50% of forest area
- There is danger of disappearing Himalayan glaciers by 2035
- The glacial melt down will first result in flooding of the rivers and then drying up
- The Ganga Delta would turn infertile
- The vector borne diseases like dengue and malaria are expected to rise sharply across India as changes in temperature make it conducive for mosquito to thrive
- Deaths from diarrheal diseases associated with floods and droughts could go up
- Up to 50% of the total biodiversity at risk in India because of climate change.

GLOBAL WARMING

Global warming shows an increase in the average temperature of earth's near surface air and oceans. The global warming and related changes may vary from region to region. The evidence of global warming is the increase in average temperature near earth's surface globally and wide spread melting of snow and ice leading to rise in the global average temperature.

Forcing of global warming: External forcing refers to the processes external climate system that influence climate or responsible for global warming. The external forcing of global warming are:

- Changes in the atmospheric conditions due to greenhouse gas concentration
- Volcanic eruptions
- Changes in solar luminosity

Effects of Global Warming

- Increase in atmospheric temperature
- Rise in sea level
- Attacks of epidemics
- Reduction in agricultural fields
- Extinctions of species
- Retreat of glaciers
- Change of ecosystem

Greenhouse Effect

Greenhouse effect is the process by which absorption and emission of infrared radiation by gases in the atmosphere, warm a planet's lower atmosphere and surface. The major greenhouse gases are water vapors, carbon dioxide, methane and ozone. The greenhouse effect change is due to the increased human activities leading to increased radioactive forcing from carbon dioxide, methane, tropospheric ozone and deforestation. The strategy to check the global warming needs:

- Mitigation to reduce further emissions
- Adaptation to reduce the damage caused by warming
- Geoengineering to reverse global warming.

CONSERVATION OF ENVIRONMENTAL HEALTH

The following measures can help to conserve environmental health:

- To conserve water in each work, e.g., cooking, washing, bathing, toilet flushing and irrigation
- Grow more trees
- Check deforestation
- Buy fuel efficient vehicles
- Effective management of industrial waste
- Make use of public transport as far as possible
- Save electricity. Put lights, fans, ACs, geysers, computers off when not in use
- Replace the traditional bulbs with CFLs
- Effective management of agricultural waste
- Save paper and avoid misuse of stationary
- Maintain right degree of pressure in tyres of cars and motorcycles
- Follow the rules of waste disposal
- Reduce air travel if work can be done by phones or email
- Demand for clean technology.

ROLE OF NURSE IN ENVIRONMENTAL HEALTH

Nurses have direct interaction with the community. They can help in facing the challenges of climate change by their positive personal action in the environmental protection. The responsibilities of nurses are mentioned as under:

- Creating awareness among the people about climate change and environmental protection by educating the communities
- Buying and using energy efficient appliances
- Taking active part in save water movements
- Giving preference to the public transport in spite of using personal vehicle
- Joining the organization working in the field of protection of ecosystem and biodiversity
- Following biomedical waste rules properly.

SUMMARY

Environment refers to all that which is external to an individual with which he/she is in constant interaction. It includes all the surroundings such as air, water, housing, food, soil, plants and animals. Sanitation is the science of safeguarding health. Environmental health is an art and science of

promoting positive environmental factors and prevention and control of all the potential hazards including physical, chemical, biological and social factors which have deleterious effect on health. The components of environment include physical environment, biological environment and social environment. Healthy environment is important to attain optimum level of health. The purpose of environmental health is to create and maintain ecological conditions that will promote health and conserve environment.

Environmental problems are increasing due to population explosion, deforestation, increased urbanization, industrialization and also due to natural calamities. Environmental education on protection of environment can help to conserve the environment. Environment pollution due to air, water, sound, radiation, chemicals, soil erosion and greenhouse effect results not only ill health but leads to climate change and global warming resulting in melting of snow and flooding of rivers and then droughts. Conservation of environment is of utmost important to sustain life on earth. Nurses by virtue of their professional commitment have major role to educate people for the conservation of environment.



ASSESS YOURSELF

Short and Long Answers Type Questions

1. Define environment. Explain the components of environment.
2. Describe the factors affecting environmental health.
3. Explain the environmental problems affecting human health.
4. What are the steps to be taken to conserve environmental health?
5. Describe the role of nurse in environmental health.
6. Write short notes on the following:
 - a. Climate change
 - b. Global warming
 - c. Greenhouse effect
 - d. Environmental pollution

Multiple Choice Questions

1. Which one of the following is not the main physical component of environment?
 - a. Bacteria
 - b. Soil
 - c. Water
 - d. Air
2. The greenhouse effect results due to excessive release of following gases except:
 - a. Carbon dioxide
 - b. Water vapors and ozone
 - c. Nitrogen
 - d. Methane
3. Which one of the following is not the main component of our environment?
 - a. Physical
 - b. Biological
 - c. Social
 - d. Spiritual
4. The following are the components of physical environment; except:
 - a. Microorganisms
 - b. Water
 - c. Air
 - d. Soil

ANSWER KEY

1. a 2. c 3. d 4. a