

According to world health organization (WHO) (1948), health is defined as:

“Health is a state of complete physical, mental and social well being, and not merely an absence of disease or infirmity. Health is a state of body when all the organs and systems are functionally properly and a perfect balance is maintained between the environment and the body.” So health has three dimensions:

- (i) Physical health involves perfect functioning of all the organs and systems of body.
- (ii) Mental health means a state of harmony and balance between the individual and the surrounding. Individual is free from anxiety and tension.
- (iii) Social health means a man having good job, a good house, a happy family, good neighbours and understanding friends.

Factors Affecting Health:-

- (i) Physical environmental factors like light, temperature, natural disasters like cyclone, flood, etc., soil type, rainfall, etc.
- (ii) Social environmental factors like job conditions, housing conditions, family's atmosphere and relationship between neighbours and friends. So social equality and harmony are necessary for good health of individuals. social environment determines our physical environment.
- (iii) Public cleanliness so as to avoid accumulation of garbage, blocking of drainage, open and stagnant water, etc. which may increase the chances of poor health.
- (iv) Supply of balanced diet for good health as it is essential for the normal body functioning growth and development of body.
- (v) Good economic conditions and good purchasing powers increase the chances of good health. This proves that personal and community issues both play important role in determining individual's health.

Characteristics of Good Health:-

The important characteristics of a person having good health are:

- (i) Free from sickness and diseases.
- (ii) Free from unnecessary anxiety.
- (iii) Free from social and psychological tensions.
- (iv) Self confidence.
- (v) Feeling of joy in living.
- (vi) Ability to work efficiently at his best.

Basic Conditions for Good Health:-

- (a) **Balanced diet:-** a balanced diet is the first condition necessary for the health of a n individual. A balanced diet prevents nutrition-deficiency diseases. It also increases our ability to fight infections in general.
- (b) **Personal and domestic hygiene:-** personal hygiene is extremely important for good health. We should bathe regularly and wear clean clothes. Bad odour associated with dirty clothes and unwashed bodies are caused by microorganisms acting on perspiration. Not brushing our teeth regularly and after meals can cause pyrrhoea, a disease in which pus forms in the gums. Clipping nails and keeping them clean, washing our hands with soap before meals and after a visit to the toilet are all essential for good health. Keeping the hose clean and airy is necessary. Otherwise, the house becomes a breeding ground for

germs. It is also important to keep the area around the house clean and free from stagnant water, which encourages the growth of mosquitoes, etc.

- (c) **Clean food and water:-** disease-causes organisms and chemical s can easily enter our bodies through the food we eat and the water we drink, fruits, vegetables ad food grains may be coated with pesticides and carry germs, insects, eggs of worms, etc. therefore, these should be thoroughly washed before cooking or eating. Cooked food should be kept in clean, covered utensils. Water carries a number of disease-causing organisms. Therefore, it is best to treat water to make it safe for drinking.
- (d) **Clean air:-** Clean air is a basic requirement for good health. Breathing polluted air causes respiratory diseases such as asthma and bronchitis.
- (e) **Exercise and relaxation:-** regular exercise keeps us fit. Regular exercise keeps our aerobic system in good shape.
- (f) **No addiction:-** An addiction causes health problems. Drinking alcohol reduces mental and physical alertness. And excessive use of alcohol may affect the nervous system and damage the liver. Smoking caused respiratory and heat diseases and cancer.

Disease:-

Any condition which interferes with the normal functioning of the body and impairs the health, is called disease. It involves morphological (structural), physiological (functional) or psychological disturbance in some body parts. It may be due to environmental factors or pathogens or genetic anomalies. This shows that disease is opposite to health. But one can be in poor health even without a simple cause of an identifiable disease.

Types of Disease:-

On the basis of period of their occurrence, the diseases are classified in two categories:

(i) **Congenital diseases.** These are inborn diseases which are present from the birth. these are generally inheritable e.g.,

- 1. Diseases caused by gene-mutations e.g., haemophilia, color blindness, etc.
- 2. Diseases caused by chromosomal mutations e.g., Down's syndrome, Klinefelter's syndrome, etc.

(ii) **Acquired diseases.** These occur only after birth and are non- inheritable. On the basis of their communication, acquired diseases are of two types:

(a) Communicable diseases and (b) Non-communicable diseases.

a) Communicable diseases:- These can be transmitted from an infected person to a healthy person by means of air, water, food, physical contact or vectors. These are caused due to infection and multiplication of some kind of micro-organisms, so are also called infectious diseases.

b) Non-communicable Diseases:- These diseases remain confined to the person who develops them and do not spread to others. Non-infectious diseases may occur due to :

- i) Malfunctioning of some important body organs (e.g., heart diseases, epilepsy etc.);
- ii) Inadequate diet or deficiency of nutrients, minerals and vitamins (e.g., Kwashiorkor, marasmus, beriberi, scurvy, night blindness etc.);
- iii) Hypo or hyper secretion of hormones (e.g., diabetes, iodine-deficiency goiter, cretinism, myxedema, exophthalmic goiter etc.);
- iv) Malfunctioning of immune system (e.g., allergy);
- v) Cancer.

Classification of Communicable Diseases:-

These can be categorized on two bases;

(i) ***Causative agent and (ii) Mode of transmission.***

(i) Depending upon the causative agent, communicable diseases are of six types:

1. Bacterial diseases e.g., diphtheria, whooping cough, leprosy, syphilis, tetanus, typhoid, tuberculosis, cholera, anthrax, etc.
2. Viral diseases e.g., dengue, influenza, measles, polio, smallpox, chickenpox, common cold, rabies, Japanese encephalitis, AIDS, etc.
3. Protozoan diseases e.g., malaria, amoebiasis, kala azar, sleeping sickness etc.
4. Helminth diseases e.g., taeniasis, ascariasis, elephantiasis, trichinosis, liver rot, etc.
5. Fungal diseases e.g., ring worm, athlete foot, etc.
6. Rickettial diseases e.g., typhus fever, trench fever, Q-fever, Rocky mountain spotted fever etc.

(ii) On the basis of their mode of transmission, the communicable diseases are of two types:

1. **Contagious diseases.** These communicable diseases can spread from an infected person to healthy person by actual contact between them e.g., STDs, smallpox, chickenpox, measles, leprosy etc.
2. **Non-contagious diseases.** These can spread from an infected person to healthy person with food, air or water e.g., taeniasis, ascariasis, cholera, tuberculosis, typhoid etc. or micro-organisms are injected inside the human body some carrier or vector hosts e.g., malaria, filariasis, plague etc.

c) Non-communicable or non-infectious diseases. These do not spread from an infected person to a healthy person. These are of four types on the basis of their causative agents :

- (i) **Deficiency diseases.** These occur either due to deficiency of some nutrients in the diet or some hormone e.g., Kwashiorkor (protein), diabetes mellitus (insulin), dwarfism (growth hormone), etc.
- (ii) **Degenerative diseases.** These occur due to degeneration of certain body tissues e.g., cardiovascular diseases (of heart and blood vessels) and arthritis (of joints).
- (iii) **Cancerous diseases.** These occur due to uncontrolled growth and division of cells in certain body tissues leading to tumour formation.
- (iv) **Allergic diseases.** These occur due to hypersensitivity of body to certain external agents, called allergens, e.g., asthma, hay fever, etc.

Causes of Diseases:-

These are two causes of Diseases.

1. *External (Extrinsic) causes or factors.*

2. *Internal (Intrinsic) causes or factors.*

1) **External (extrinsic) causes or factors.** These are the disease causing (pathogenic) agents which enter the human body from outside and affect the normal functioning of the body. External causes can further be categorized as:

(i) **Disease causing microorganisms commonly called pathogens.** The pathogens include viruses, bacteria, fungi, protozoans, helminthes and worms etc. these pathogens are transferred to the human body through air, contaminated water, food, soil, physical contact, sexual contact, and animals.

(ii) **Inadequate diet.** Absence of nutritious diet makes a person unhealthy. Unhealthy persons are more susceptible to diseases or infections. deficiency of nutrients in the diet results in number of deficiency diseases in human beings, e.g., night blindness, beriberi, scurvy, rickets, osteomalacia, bleeding disease, marasmus, Kwashiorkor etc.

(iii) **Environmental pollutants.** Various environmental pollutants such as gases (e.g., oxides of carbon, oxides of nitrogen and oxides of sulphur), particulate matter, industrial chemicals, heavy metals (e.g., mercury, lead, and cadmium, arsenic), pesticides etc. also are causes of infections or diseases.

(iv) **Tobacco, alcohol and narcotic drugs.** Continuous use of tobacco, alcohol and narcotic drugs result in harmful effects leading to chronic diseases.

2) **Internal (intrinsic) causes or factors.** These disease causing factors exist within the human body and are non-infectious. Internal causes or factors are further categorized as:

- (i) Malfunctioning or improper functioning of body parts such as heart, kidney, liver etc.

- (ii) Genetic disorders.
- (iii) Hypo or hyper secretion of hormones.
- (iv) Malfunctioning of body's immune system.

Acute and Chronic Diseases:-

Depending upon the duration for which a disease persists, diseases are grouped into two categories:

1. Acute diseases
2. Chronic diseases

1) **Acute diseases.** These diseases last for only short periods of time and are severe. The acute diseases do not cause long term bad effects on our health. Examples of acute diseases are cold, cough, typhoid, cholera etc.

2) **Chronic diseases.** These diseases last for a long time even as much as a lifetime. The chronic diseases have drastic long term effects on patients' health. Examples of chronic diseases are diabetes, tuberculosis, elephantiasis, cardio-vascular diseases, arthritis cancer etc, elephantiasis is very common in some parts of India.

Difference between Acute and Chronic Diseases:-

<u>Acute Diseases</u>	<u>Chronic Diseases</u>
1. These last for only short period of time.	1. These last for a long time, even as much as a lifetime.
2. These do not cause long term bad effects on human health.	2. These cause drastic long term effects on human health.
3. Examples include cold, cough, typhoid, cholera etc.	3. Examples include elephantiasis, cardio-vascular diseases, tuberculosis, diabetes, arthritis, cancer etc.

Acquired Diseases:-

These diseases develop after birth. They are further of two types:

- (i) Infectious (communicable) diseases
 - (ii) Non-infectious (Non-communicable) diseases.
- i) **Infectious (communicable) diseases.** These diseases are spread from infected person to others in various ways, i.e., through air, water, food, physical contact, sexual act and insects. The causative agents of these diseases are called pathogens or infectious agents. These May be viruses, bacteria, fungi, protozoans (single-celled animals) and different kinds of worms (multicellular organisms.)
- ii) **Non-Infectious (non-communicable) Diseases.** These diseases remain confined to the person who develops them and do not spread to others. Non-infectious diseases may occur due to:
- (a) Malfunctioning of some important body organs (e.g., heart diseases, epilepsy etc.);
 - (b) Inadequate diet or deficiency of nutrients, minerals and vitamins (e.g., Kwashiorkor, marasmus, beriberi, scurvy, night blindness etc.);
 - (c) Hypo or hyper secretion of hormones (e.g., diabetes, iodine-deficiency goiter, cretinism, myxedema, exophthalmia goiter etc.);
 - (d) Malfunctioning of immune system (e.g., allergy);
 - (e) Cancer.

Modes of spread of communicable Diseases:-

Communicable diseases spread from the reservoir of infection to a healthy person in the following ways.

Direct transmission:-

The pathogens of certain diseases react and infect healthy person directly without an intermediate agent. It can take place by various means.

- (i) Direct contact between the infected person and the healthy person. Direct contact with the discharge from the lesions, sores on the skin may cause infection. Diseases like small pox, chicken pox, syphilis, gonorrhea, spread through direct contact. Kissing also spreads infection.
- (ii) Droplet infection: the infected person throws out tiny droplets of mucus by coughing, sneezing, spitting or even talking. These droplets may contain pathogens (virus, bacteria). By inhaling the air containing the droplets, a healthy person may get the infecting. Diseases like common cold, pneumonia, influenza, measles, mumps, tuberculosis and whooping cough are spread by droplet infection.
- (iii) Contact with soil contaminated with disease-causing viruses, bacteria, etc. the bacteria responsible for tetanus enter the human body from the soil.
- (iv) Animal bite: viruses of rabies are introduced through the wound caused by the bite of raid animals, especially dogs. The virus is present in the saliva of the rabid animal.
- (v) Transplacental transmission by diseases causing organisms which may pass from the mother's body to the fetus through placenta. For example, virus of German measles, AIDS virus.

Manifestations of Diseases (Disease Symptoms):- The disease symptoms are of two types:

1. Organ-specific and tissue-specific manifestations.
2. Common manifestations.
 - 1) **Organ-specific and tissue-specific manifestations** depend on the target organ which the microbes target after their entry e.g.,

Target organ	Specific manifestation
1. Lungs	Cough, breathlessness, chest pain and may be bloody sputum as in TB and lung cancer .
2. Liver	Inflammation of liver cells leading to jaundice characterized by yellowness of skin and eyes as in Hepatitis .
3. Intestine	Inflammation of intestinal mucosa leading to acute diarrhea and dehydration as in cholera .
4. Nasal chambers	Inflammation of nasal mucosa leading to sneezing, bronchitis, coughing, fever, etc. as in influenza .
5. brain	Headaches, vomiting, fits or unconsciousness.

- 2) **Common manifestations.** These are observed in a number of diseases and generally occur due to activation of immune cells in response to infectious agents. These immune cells either produce antibodies or actually attack and kill the disease causing microbes. This is manifested in the form of inflammation characterized by redness of the infected area, swelling, fever and increase in permeability of the capillaries of that area.

Severity of disease manifestations depends upon the following factors:-

1. **Number of microbes** inside the body so the disease manifestations may be minor and unnoticeable when the number of microbes is very small while these symptoms may be large enough and life threatening when the infection is large, number of surviving microbes inside the body depends upon the immune system.
2. **On the tissue or organ** which the microbes target e.g., HIV enters in the body through the sexual contact but spreads to lymph nodes through the body.

Principals of Treatment of Diseases:-

There are two ways to treat an infectious disease. They are:

(a) Reduce the Effect of the Disease. The treatment reduces the effect disease without killing the infectious agent. This is carried out by two methods, symptomatic treatment and rest.

i) ***Symptomatic Treatment.*** Medicines are taken to treat symptoms of the disease. Symptoms are related to inflammation e.g., fever, pain, sneezing, coughing, loose motions. Medicines bring down fever (antipyretic), reduce pain (analgesic), control motions (antidiarrhoeal), check sneezing and coughing (antiallergic).

ii) ***Bed Rest.*** Best rest is advised to conserve energy for making the same available for healing.

(b) Killing the Microorganisms of Infectious Agents. The infectious agents like bacteria, viruses, fungi, helminthes and protozoans have some essential biochemical life processes which are peculiar to their group and not shared with the other groups. These processes may be pathways for respiration or synthesis of new substances. Drugs are available which block these processes and kill the infectious agents.

Antibiotics are drugs which can block the biochemical life processes of bacteria without harming human cells. Penicillin prevents cell wall synthesis in bacteria. Similarly, there are drugs to kill protozoans like malarial parasite, helminthes like roundworms.

Principals of Prevention of Diseases:-

There are two ways of prevention of infectious diseases:

- a. General ways
- b. Specific ways

A. General ways of prevention of infectious diseases. These include:

1. ***Sanitation.*** Public hygiene is one basic key to the prevention of infectious (communicable) diseases. Garbage heaps, polluted water, foods exposed to dust and flies are the chief sources of disease-causing organisms. Sanitary surroundings can prevent spread of diseases. For air-borne microbes, we can prevent exposure by providing living conditions that are not overcrowded. Similarly, safe drinking water can be provided to prevent exposure to water-borne microbes. This can be done by treating the water with disinfectants before its distribution.
2. ***Eradication of vectors.*** Vector-borne infections can be prevented by providing clean environments. The breeding places of vectors should be destroyed and adult vectors killed by suitable methods.
3. ***Sterilization.*** Patients's surroundings and articles of use should be sterilized. Soap, phenyl, dettol, and antiseptic lotion may be used wherever necessary.
4. ***Isolation.*** A person suffering from an infectious disease should be segregated so that others do not catch infection from him.
5. ***Education.*** People should be educated about the infectious diseases so that they may protect themselves against such infections.
6. ***Proper and sufficient food.*** Availability of proper (nutritious) and sufficient food to everyone will make people healthy to resist infections.

B. Specific Ways of Preventing Infection. They are methods to strengthen body's immune system so as to check the occurrence of microbial infection. The property is called immunity and the method of developing immunity is called immunization. Immunization is generally carried out through vaccination or administration of vaccines.

Vaccination is the most common method of preventing infection of microorganisms, especially bacteria and viruses. In this a vaccine (antigen) is inoculated inside body to stimulate the formation of antibodies by the immune system. The antigen mimics the microbe against which we want to develop the immunity. This does not actually cause the disease but this would prevent any subsequent exposure to the infecting microbe from turning into actual disease.