

## CHAPTER II

### CONCEPT OF HEALTH, HEALTH CARE AND THE INDUSTRIAL WORKER

#### 2.1 Introduction

Health problems associated with industrialisation are as much an issue of the developed world as of the developing areas. Historical evidences of disease and death associated with a variety of industries in the developed world, in the early stages of the industrial revolution, are not uncommon. However in the developed world, the laws and legislations are today, far more stringent, and the spatial distribution of industries much more planned and organised than they are in the developing countries.

The problem of health and industrialisation involves the dual problem of provision of health care for industrial workers and the prevention of occurrence and spread of occupational diseases.

#### 2.2 Industrialisation and health hazards

The quality of human life is dependent on the character of various factors of the natural and social environment. These include among others, clean air, water, light and sunshine, an equable temperature, uncontaminated nutritious

food, peaceful surroundings and congenial relationship in place of work and residence. Any deterioration of these factors of the environment can result in corresponding decline in the quality of life. One of the causes of deterioration of the environmental attributes in the modern world is the increasing industrial activities. The contamination of air and water through its emissions from industrial processes, the long working hours in ill-lit factory premises, the heat generated by the manufacturing processes, the noise created by the machine, and constant discontent among workers resulting from dissatisfaction with long and unpleasing working conditions are some of the situations emerging from the modern industrial revolution. The consequent impact manifests in the form of increasing ill-health of the industrial workers which ultimately leads to the inevitable decline in the quality of life in the industrial areas in particular.

### 2.3 Health of Industrial Workers

Industrial workers constitute a segment of the general population. The factors of the environment that influence health of the population in any area are equally applicable to industrial workers. In addition to these factors the health of the industrial workers will also be influenced by the conditions prevailing in their work place. So one should look for a healthy occupational environment in order to safeguard the health of the workers.

Occupational environment means the sum of external conditions and influences which prevail at the place of work. Basically, there are three types of interaction in a working environment.

1. Man and physical, chemical and biological agents
2. Man and machine
3. Man and Man.

#### 2.4 Man and Physical, Chemical and Biological Agents

1. Physical agents: The physical factors in the working environment which may be adverse to health are heat, cold, humidity, air movement, heat radiation, light vibration and ionizing radiation. These factors act in different ways on health and efficiency of the worker. The amount of working and breathing space, toilet, washing and bathing facilities are also important factors in an occupational environment.

2. Chemical agents: These include a large number of chemicals, toxic dusts and gases which are a potential hazard to health of the workers. Some of the chemical agents cause disabling respiratory illness, injury to the skin and some may have adverse effect on blood and other organs of the body.

3. Biological agents: The workers may be exposed to viral, rickettsial, bacterial and parasitic agents which may result from close contact with animals or their products,

contaminated water, soil or food.

## 2.5 Man and Machine

Industry makes use of machines for mass production. The unguarded machines, their moving parts, poor installation of the plant, and lack of safety measures are the main causes of accidents. It is a major problem in industries. Working for long hours in such unhealthy conditions, poor postural positions become the cause of fatigue, headache, disease of joints and muscles.

## 2.6 Man and Man

There are many psycho-social factors which operate at the place of work. These are the human relationships amongst the workers themselves and between the workers and the authorities. Psycho-social factors include the type and rhythm of work, work stability, service conditions, job satisfaction, leadership style, security, worker participation, communication, system of payment, welfare conditions, degree of responsibility, trade union activities and a host of similar other factors.

In modern occupational health, the emphasis is upon the people, the condition in which they live and work, their hopes, their attitude towards their job, their fellow workers and employers.

The occupational environment of the worker cannot be considered apart from his domestic environment; both are complementary to each other. The worker takes home his worries and brings the disturbances of the home to his working place. Stress at work may disturb his sleep and family relations. Similarly stress at home affects his work.

## 2.7 Occupational Hazards

Commonly the following five types of hazards are experienced in the industries, depending on the nature of the job:

- (a) Physical hazards
- (b) Chemical hazards
- (c) Biological hazards
- (d) Mechanical hazards
- (e) Psycho-social hazards

## 2.8 Physical Hazards

2.8.1 Heat & Cold: The common physical hazard in most industries is heat. The direct effect of heat are burns, heat exhaustion, heat strokes and heat cramps. The indirect effects are decreased efficiency, increased fatigue etc.

Many industries have local "hot-spots" - ovens and furnaces, which radiate heat. Radiant heat is the main problem in foundries, glass and steel industries. The heat stagnation is the problem in jute and cotton textile industries. High

temperature is also found in mines.

2.8.2 Light: The workers may be exposed to the risk of poor or excessive brightness. The acute effects of poor illumination are eye strain, headache, eye-pain, congestion around the cornea and eye fatigue. Exposure to excessive brightness or "glare" is associated with discomforts, annoyance and visual fatigue. Instance of direct light may also result in blurring of vision and accident. There should be sufficient and suitable lighting, natural or artificial, wherever the person is working.

2.8.3 Noise: Noise is a health hazard in many industries. The effects of noise are of two types.

- (i) Auditory effect which consists of temporary or permanent hearing loss;
- (ii) Non-auditory effect which consists of nervousness, fatigue, interference with communication and with speech and decreased efficiency.

2.8.4 Vibrations: Vibrations especially from drills and hammers, affect the hands and arms. After some years of exposure the fine blood vessels of the fingers may become increasingly sensitive. It may also produce injuries of the joints, of the hands, elbows and shoulders.

2.8.5 Ultra-Violet Radiation: This exposure occurs mainly when the soluble dusts dissolve slowly, enter the

systemic circulation and are eliminated by the body metabolism. The insoluble dust remains more or less permanently in the lungs.

2.8.6 Gases: Exposure to gases is a common hazard in industries. Gases are classified as simple gases (i.e., carbon monoxide, sulphur dioxide, chlorine) and anaesthetic gases (i.e. chloroform, ether). Carbon monoxide hazard is frequently reported in coal-gas manufacturing plants and steel industries.

(ii) Metal and other compounds: A large number of metals, and their compounds are used in industry. The chief mode of entry of some of them is by inhalation as dust or fumes. The ill-effects depend on the duration of exposure.

(iii) Ingestion: Occupational diseases may also result due to ingestion of chemical while welding. Such radiations mainly affect the eyes. Symptoms are redness of the eyes and pain. This usually disappears after some days with no permanent effect on the eyes.

(iv) Ionizing Radiation: Ionizing radiations are finding increasing application in medicine and industry, e.g., x-rays and radio active isotopes. Certain tissues such as bone marrows are more sensitive than others and form a genetic standpoint. There are special hazards when gonads are exposed. The International Commission of Radiological

Protection has set the maximum permissible level of occupational exposure at 5 rem per year to the whole body.

## 2.9 Chemical Hazards

There is hardly any industry which does not make use of chemicals. The chemical hazards are on the increase with the introduction of newer and complex chemicals. The ill-effects depend on the duration of exposure. Chemical agents act in three ways:

2.9.1 Local Action: Some chemicals cause eczema, ulcer and even cancer by primary irritant action but some of the chemicals enter in the skin and cause systemic effects. Occupational dermatitis is a big problem in industry.

2.9.2 Inhalation of Dust: The dust particles are released into the atmosphere during crushing, grinding, loading and unloading operations. Dusts are produced in a number of industries, mines, foundry, quarry, pottery, textile, wood, cement or stone industries. Dusts have been classified into organic or inorganic dusts; soluble and insoluble dusts. The inorganic dusts are silica, mica, coal etc. the organic dust are - cotton, jute and the like, substances such as lead mercury, zinc chromium, cadmium, phosphorus, etc. Usually these substances are swallowed through contaminated hands, food or cigarettes. Much of the ingested material is excreted and only a small portion may enter blood circulation.



### 2.10 Biological Hazards

Workers may be exposed to infective and parasitic agents at the place of work. Persons working among animals, or engaged in manufacturing from animal products, i.e., hair, wool etc., and agricultural workers, are specially exposed to biological hazards.

### 2.11 Mechanical Hazards

The mechanical hazards in industry centre around machinery. Unprotected protruding and moving parts and like cause about ten percent of accidents in the industry.

### 2.12 Electrical Hazards

Electricity is extensively used in industry it has proved a good servant but a bad master. A little carelessness in maintenance on the part of worker may lead to severe accidents, i.e., fire, extensive damage to machinery or electrocution of the worker. Electric shock leading to burns, injury, numbness and paralysis of body parts and death are also not uncommon. Use of electric arc furnace also presents health hazards.

### 2.13 Psycho-social Hazards

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These hazards arise from the worker's inability to adapt to an alien psycho-social environment. Frustration, lack of job satisfaction, insecurity, poor human relationship and emotional tension are some of the psycho-social factors which may undermine both physical and mental health of the workers.

The capacity to adapt to different working environments is influenced by many factors such as education, cultural background, family life, social habits and workers' expectations from employment.

The health effects can be classified in two main categories (a) Psychological and behavioural changes: including hostility, aggressiveness, anxiety, depression, tiredness, alcoholism, drug abuse (b) Psychosomatic ill - health: including fatigue, headache, pain in the shoulders, neck and back, hypertension, etc.

### 2.14 Industrial patterns in urban areas in India

Industries in urban areas of India reveal by and large a haphazard distribution of factory units. Industrial zoning is practically absent although it may constitute a theoretical conception. The character of industries may also be heterogeneous, with perhaps, chemical, engineering and food processing all juxtaposed. This makes the provision of controlling the risk factors of individual

type of industries all the more difficult.

#### **2.15 Socio-economic characteristics of industrial workers**

The vast majority of factory workers, in India belong to the unskilled or semi-skilled categories. On an average the monthly earnings of these people do not exceed Rs. 1600. This amount is hopelessly inadequate to maintain a decent standard of living, leave alone spending on health care and other exigencies. Their economic, cultural and educational background may perhaps be a factor that prevents them from demanding better working environment and amenities for maintaining good health. Most of the workers are lured to industries with the expectation of good pay packets. Little are they aware of the hazards to their health and life that lies in store for them. When realisation does dawn, they have neither the means nor the physical strength to either retrace their steps or demand justice.

#### **2.16 Health and health care of industrial workers in Vadodara**

As an illustration, the situation in the industrial areas of Vadodara city in Gujarat, India may be cited. Vadodara has a rapidly expanding industrial structure. The chemical industry is, today, the main industry in this urban area and includes the manufacture of a wide range of products such as petrochemicals, acids, paints, dyes, plastics,

synthetic rubber, and several others. Industries such as glass, textiles, pharmaceuticals, engineering and saw milling are also among the major activities in the city.

Enough literature is available which describe the nature of occupational diseases that can arise from the above industries. Details of the causes of these diseases is not the objective of this study. It would therefore, perhaps, suffice to mention that diseases such as silicosis, byssinosis, tuberculosis, bronchial asthma, dermatitis, loss of hearing, cataract and unusual greying of hair, are some of the ailments that have been detected among factory workers in Vadodara. Sufficient data on occupational diseases are, unfortunately, neither maintained nor disclosed. There is only one hospital under the Employees' State Insurance Scheme (E.S.I.S) in the city which serves the entire population of industrial employees of Vadodara city and its suburbs. There are eighteen dispensaries run by the E.S.I.S., located in different parts of the city, which refer suspected occupational diseases to the hospital. Some respiratory ailments are also referred to the respiratory clinic of the government run civil hospital and to the T.B. Hospital situated near the E.S.I.S. hospital. However, in the records of these hospitals, the number of cases are very few. Investigations have revealed that this is due not to the non-occurrence of disease, but is the result of gross under-reporting. Health care delivery for industrial workers therefore falls far short of requirement.