Mangala Subramanian

Handbook of Community Medicine



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Foreword
S Pruthvish

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Chapter 4

Health Study

MENTAL HEALTH

Health is a state of complete physical, mental and social wellbeing and not merely absence of disease or infirmity.

Mentally Healthy Person

Accepts himself, secure, adequate, neither underestimates nor overestimates his ability, accepts his shortcomings, has self-respect, gets along with other people, takes responsibility for neighbors and fellow countrymen, able to meet the demands of life and has problem solving capacity.

Mentally Ill Person

Worry, no concentration, unhappy, loses temper easily, loss of sleep, mood swings, dislikes people, bitter, fear, nervous, aches and pains.

Mental Illness

1. Psychosis
   i. Schizophrenia (split personality)
   ii. Manic depressive psychosis
   iii. Paranoia.
2. Neurosis/Psychoneurosis—Morbid fears, compulsions, obsessions
3. Personality/character disorder.

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Causes

1. *Organic conditions:* Cerebral atherosclerosis, neoplasms, neurological diseases, endocrine diseases, TB, leprosy, epilepsy.
2. *Heredity:* Schizophrenia, depression.
3. *Social factors:* Stress, worries, anxiety, unhappy marriages, broken homes.
4. *Economic factors:* Poverty, poor standard of living.
5. *Environmental factors:* Toxic substances, e.g. lead; drugs, e.g. alcohol, barbiturates; trauma, e.g. road accidents, occupational accidents; infective agents, e.g. measles, rubella; radiation.
6. *Crucial life points uncared:* (i) Pregnancy, (ii) under 5 years. (iii) School child, (iv) Adolescence, (v) Elderly.

Prevention

i. *Primary prevention:* Improving social environment, better living conditions, improved health care services
ii. *Secondary prevention:* Early diagnosis of mental illness and treatment, counseling services
iii. *Tertiary prevention:* Rehabilitation.

Mental Health Services

1. Early diagnosis and treatment
2. Rehabilitation
3. Group and individual psychotherapy
4. Psychoactive drugs
5. After care services
6. Mental health education.

Alcoholism and Drug Dependence

Drug dependence—A state, psychic sometimes physical, characterized by behavioral responses and compulsion to take the drug.

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Agent Factors

1. Alcohol
2. Tobacco
3. Opioids
4. Cannabinoids
5. Sedatives/hypnotics
6. Cocaine
7. Other stimulants including caffeine
8. Hallucinogens
9. Volatile solvents
10. Others used in combination.

Host Factors

Age—Young age
Sex—M>F
Social factors
Economic factors.

Environmental Factors

Peer pressure, Media Advertisement, Movies

Clinical Features

Loss of interest in daily activities, sports
Loss of appetite, weight
Gait unsteady, tremors
Eyes—Red, puffy
Speech—Slurred
Skin—Injection marks
GIT—Nausea, vomiting
CNS—Drowsiness, sleeplessness
Mood—Changing moods, temper
Depersonalization, emotional detachment
Impaired memory, concentration
Presence of needles, syringes, strange packets at home.

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Factors Associated with Drug Abuse

Unemployment, living away from home, urbanization, relaxed parental control, early exposure to drugs, broken homes, one parent families, occupation, e.g. tourism, drug production or sale, areas with high crime rates or vice, delinquency.

Prevention

1. *Legislation:* Control on manufacture, sale, prescription, e.g. no smoking in public places or public vehicles, prohibition of sale to minors, statutory warning on cigarette packets
2. *Health education:* For example, school health education
3. *Community approach:* Alternative activities, e.g. teen centers for athletics, sports, music, artistic activities
4. *NGOs.*

Treatment

Deaddiction programs
Postdetoxication counseling and follow-up
Rehabilitation
Breakaway from peer group.

National Mental Health Programme

1982 launched

Objectives

1. To ensure availability and accessibility of mental health care to underprivileged populations
2. To encourage application of mental health knowledge in general health care and social development
3. To promote community participation in mental health services development.

Strategies

1. Integration of mental health with primary health care

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2. Provision of tertiary care institutions for treatment of mental disorders
3. Eradicating stigmatization of mentally ill patients.

District Mental Health Programme Components

1. Training for all workers at the state institute
2. Early detection and treatment
3. Health education of public to increase awareness and reduce stigma
4. Data collection, analysis for future planning of services
5. Upgrading medical colleges' department of psychiatry
6. Research.

GENETICS AND HEALTH

Genes

Genes are units of heredity.
They contain hereditary information for transmission from generation-to-generation.
They may be homozygous, e.g. AA or heterozygous, e.g. aA.
They are located on the chromosomes which are autosomes (22 pairs) and sex chromosomes (1 pair).
Mitosis: Ordinary cell division
Meiosis: Reduction division, diploid → haploid (46 to 23).

Classification

i. Chromosomal abnormalities
ii. Unifactorial (single gene or Mendelian disease)
iii. Multifactorial disorders.

Chromosomal Abnormalities
Klinefelter's syndrome, XYY syndrome, Turner's syndrome, Super females.

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Mendelian diseases

Autosomal dominant	*Autosomal recessive*	*Sex-linked disorders*
Polyposis coli	Phenylketonuria	Recessive:
Huntington's chorea	Alkaptonuria	Hemophilia type A and B
Neurofibromatosis	Maple syrup urine disease	Duchenne muscular dystrophy
Marfan's syndrome	Cystic fibrosis	Color blindness
Retinoblastoma	Fibrocystic disease of pancreas	G6PD deficiency
ABO blood group	Agammaglobulinemia	Retinitis pigmentosa
Hyperlipoproteinemia I, II, III, IV	Hemoglobinopathies	Hydrocephalus
Polycystic kidney	Galactosemia	Agammaglobulinemia, Bruton type
	Hirschsprung's disease	Dominant: Vitamin D resistant rickets

Multifactorial Disorders

Hypertension, schizophrenia, mental retardation, duodenal ulcer, ischemic heart disease, diabetes, congenital heart malformations.

PREVENTIVE AND SOCIAL MEASURES

Primary Prevention

Health Promotion

i. *Eugenics:* Science which improves genetic endowment

Negative Eugenics

Aim: To reduce frequency of hereditary diseases and disability.

Hitler to improve the German race killed the weak and defective people who have serious hereditary diseases. They could be sterilized instead.

Positive Eugenics

Aim: To improve the genetic composition of the population by encouraging carriers of desirable genotypes to assume parenthood.

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ii. *Euthenics:* Environmental manipulation is euthenics. An environment which will enable the genes to express themselves. Dr Glen Doman did research on mentally subnormal children and found that their IQ could be improved with environmental stimulation.
iii. *Genetic counseling:* Prospective genetic counseling: If heterozygous marriage can be prevented, prospects of giving birth to children with genetic disease reduces, e.g. sickle cell anemia, thalassemia. Screening to identify heterozygous individuals is beneficial.

Retrospective genetic counseling: This is commonly done. After the disorder occurs in the family, counseling is sought to prevent further abnormalities in siblings, e.g. congenital abnormalities, mental retardation, psychiatric illness, inborn errors of metabolism, sickle cell anemia, thalassemia.

Genetic counseling centers should be established.

Methods

i. Contraception
ii. MTP
iii. Sterilization.
iv. *Consanguinous marriages:* Increased risk of abnormal offspring when blood relatives marry, e.g. diabetes, hypertension, coronary heart disease, hypercholesterolemia, alkaptonuria, phenylketonuria, albinism, retinitis pigmentosa.
v. *Late marriages:* Mongolism is more frequent in children of elderly mothers, therefore, early marriages are favored.
vi. *Specific protection:*
    a. *X-ray:* Protection from unnecessary X-rays or protection of gonads during X-ray investigation.
    b. *Anti-D:* Globulin to mother after delivery of Rh+ve baby.

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Secondary Prevention

Early diagnosis and treatment.

a. *Detection of genetic carriers:* Healthy carriers can be identified, e.g. Duchenne type muscular dystrophy, hemophilia, PKU, galactosemia.
b. *Prenatal diagnosis:* Amniocentesis at 14 to 16 weeks can be done for diagnosis, e.g. Down's syndrome, galactosemia, Maple syrup urine disease, Tay-Sachs disease, alpha thalassemia, neural tube defects.
   Indications for amniocentesis
   i. Mother ≥ 35 years
   ii. Parents with Down's child
   iii. Parents with chromosomal anomaly child
   iv. Parents with metabolic defect child, e.g. neural tube, anencephaly, spina bifida.
   v. Parents with chromosomal translocation.
   vi. For sex determination in sex-linked genetic disease, e.g. muscular dystrophy.

Indications for prenatal diagnosis

Indications	*Methods*
a. Advanced maternal age, previous child with chromosomal abnormality, intrauterine growth delay	Cytogenetics (amniocentesis, chorionic villus sampling)
b. Biochemical disorders	Protein assay, DNA diagnosis
c. Congenital anomaly	Sonography, fetoscopy
d. Screening for neural tube defects and trisomy	Maternal serum alpha fetoprotein and chorionic gonadotropin

c. *Screening of newborn infants:* Screening tests can be done on newborns, e.g. sex chromosome abnormalities, congenital dislocation of hip, PKU, congenital hypothyroidism, sickle cell disease, cystic fibrosis, Duchenne muscular dystrophy, congenital adrenal hyperplasia, G6PD deficiency, etc.

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d. *Recognizing preclinical cases:* Screening tests for diagnosis of PKU, urine sugar for diabetes, Se uric acid for gout, sickle cell trait by subjecting red cells to reduced oxygen tension, thalassemia minor by blood picture.

Tertiary Prevention

Rehabilitation

Medical, surgical, psychological, social, educational measures to train and retrain a person to the highest capability.

OCCUPATIONAL HEALTH

Promotion of physical, mental, social, well-being of workers, prevention of diseases, protection from risks, adaptation of work for man and of each man to his job.

Ergonomics

Greek ergon = work
nomos = law
means fitting the job to the worker.

Designing of machines, tools, equipment, manufacturing processes and layout of work places for efficiency of man and machine. Objective of ergonomics is to achieve best mutual adjustment of man and his work for human efficiency and well-being.

Occupational Diseases

Diseases due to Physical Agents

1. *Heat*—Heat hyperpyrexia, heat exhaustion, heat syncope, heat cramps, burns, prickly heat
2. *Cold*—Trench foot, frostbite, chilblains
3. *Light*—Occupational cataract, miner's nystagmus
4. *Pressure*—Caisson's disease, air embolism
5. *Noise*—Occupational deafness
6. *Radiation*—Cancer, leukemia, aplastic anemia, pancytopenia

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7. *Electricity*—Burns
8. *Mechanical factors*—Injuries, accidents.

Diseases due to Chemical Agents

1. Gases CO_2, CO, HCN, CS_2 NH_3, N_2, H_2S, HCl, SO_2, cause gas poisoning.
2. Dusts (pneumoconiosis)
   i. Inorganic dusts:
      a. Coal dust—Anthracosis
      b. Silica—Silicosis
      c. Asbestos—Asbestosis, cancer lung
      d. Iron—Siderosis
   ii. Organic dusts:
      a. Cane fiber—Bagassosis
      b. Cotton dust—Byssinosis
      c. Tobacco—Tobacosis
      d. Hay or grain dust—Farmer's lung
3. Metals and their compounds: Toxic hazards from lead, mercury, manganese, cadmium, berrylium, arsenic, chromium
4. Chemicals—Acids, alkalis, pesticides
5. Solvents—Benzene, trichloroethylene, chloroform.

Diseases due to Biological Agents

Brucellosis, leptospirosis, anthrax, actinomycosis, hydatidosis, psittacosis, tetanus, encephalitis, fungal infections.

Occupational Cancers

Skin cancer, lung cancer, leukemia, bladder cancer, scrotal cancer.

Occupational Dermatosis

Dermatitis, eczema.

Diseases of Psychological Origin

Neurosis, hypertension, peptic ulcer.

Pneumoconiosis

Inhalation of organic or inorganic dust of 0.5 µ produces pneumoconiosis causing inflammatory changes in lungs, infections, fibrosis and reduces work capacity.

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Silicosis	*Anthracosis*	*Byssinosis*	*Bagassosis*	*Asbestosis*	*Farmer's lung*
Cause: Inhalation of dust containing SiO_2	Coal dust	Cotton fiber dust	Bagasse = sugar-cane dust Thermoactino-myces sacchari	Asbestos fiber	Mouldy hay/grain dust *Micropolyspora faeni* (thermophilic-actinomycetes)
Occupation miners (in coal, mica, gold, silver lead, zinc) iron and steel industry, pottery, ceramic industry, sand blasting, metal grinding, building and construction work	Coal miners			In industry for manufacturing asbestos cement, fireproof textiles, roof lining, brake lining	
Cl. features cough, breathlessness, chest pain, total lung capacity decreases	(a) Simple pneumoconiosis (b) Progressive massive fibrosis (PMF) severe respiratory disability, death	Cough, breathlessness, chronic bronchitis, emphysema	Cough breathlessness hemoptysis, fever, fibrosis, emphysema, bronchiectasis	Cough, clubbing, cyanosis, resp. insufficiency, bronchogenic Ca, mesothelioma Ca of GIT, risk of Ca ↑ with smoking, fibrosis, death	Cough breathlessness impairment of pulmonary function, cor pulmonale

Contd...

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Contd...

Silicosis	*Anthracosis*	*Byssinosis*	*Bagassosis*	*Asbestosis*	*Farmer's lung*
CXR–snowstorm appearance silicotuberculosis			Mottling shadow, impairment of pulmonary function	X-ray—ground glass appearance	
Rx no treatment, control by a) dust control measures, e.g. enclosure substitution, isolation, hydroblasting, good house keeping, personal protection	No Rx Notifiable disease compensatable in Workmen's Compensation Act	No Rx Prevention—dust control Periodic examination	Dust control, personal protection, medical control, bagasse control	No Rx Prevention—safe types of asbestos use substitution, dust control	No Rx

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Handbook of
Community Medicine

This book has been written based on the needs of medical, dental, nursing and para-medical students to give them a better understanding of community medicine which is a very vast subject.



Mangala Subramanian completed her MBBS from Stanley Medical College, Chennai, Tamil Nadu, India in 1981 and MD in Community Medicine from MS Ramaiah Medical College, Bengaluru, Karnataka, India in 1997. She also did a Postgraduate Diploma in Hospital and Health Management (PGDHHM) from Indira Gandhi National Open University Centre at Command Hospital, Bengaluru, Karnataka, India in 2005. She underwent training conducted by Foundation for Advancement of International Medical Education and Research (FAIMER) from 2009 to 2011 at G Seth Medical College, Mumbai, Maharashtra, India. She is currently working as the Professor of Community Medicine, Vydehi Institute of Medical Sciences and Research Centre, Bengaluru, Karnataka, India. Her main areas of interest are in prevention and management of protein-energy malnutrition in under-five children, primary prevention of smoking among school-children and early diagnosis and treatment of diabetes mellitus to prevent complications. She has several publications to her credit and has presented papers in State and National conferences.

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Preventive & Social Medicine

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Medical Publishers (P) Ltd.
www.jaypeebrothers.com

ISBN 978-93-5025-923-8
9 789350 259238