

SYLLABUS: DIETICIAN in Municipal Corporation in Delhi

ADVANCED NUTRITION THEORY

Human Nutrient Requirements

- Historical perspective of nutrient requirements, terms used
- Methods of assessment of nutrient needs – a critical review Biological role, sensitive methods for derivations of requirements and recommended dietary allowances of specific nutrients such as Energy, Carbohydrates and dietary fiber, Proteins and amino acids, Lipids and fatty acids , Water, Fat and water soluble vitamins, Minerals
- Critical evaluation of national and international nutrient allowances; factors affecting the requirements.

Growth and Development through the Life Cycle

- Determinants of growth and development
- Changes in body composition throughout the life cycle
- Impact of altered nutrition on growth and development
- Maternal malnutrition and pregnancy outcome
- Malnutrition and cognitive development
- Changing trends in lifestyle and dietary patterns in population groups and their implications on nutritional status and disease

Interactions of Nutrition, Immunity and Infection

- Host defense mechanisms and nutrients essential in the development of immune system
- Effect of infections on the nutritional status of an individual
- Nutrient deficiencies and excesses affecting the immuno-competence and susceptibility to infections
- Operational implications

Improving Diet Quality

- Measurement of diet quality
- Methods of improving nutrient content and bioavailability-fortification, GM foods, dietary diversity ,home based solutions
- Measurement of protein quality, factors affecting and methods of improving protein quality
- Critical evaluation of national and international dietary guidelines
- Functional foods and bioactive substances, Nutraceuticals, Nutrigenomics

THERAPEUTIC NUTRITION

Nutritional Assessment and Care of Patients

Nutrition care process

Nutritional screening and assessment of patients–out patient & hospitalized, Tools for screening,

Nutritional interpretation of routine medical and laboratory data Nutrition care plan and implementation,

Monitoring and follow up, Ethical issues, Dietary counseling, Nutrition Support: Enteral nutrition

Medical Nutrition Therapy for Weight Management and Metabolic Disorders

- Obesity and underweight
- Eating disorders
- Diabetes mellitus–Type 1, Type 2 and Gestational diabetes
- Inborn disorders of metabolism (PKU, Galactosemia and MSUD)
- Gout

Coronary Heart Diseases

Etiopathophysiology, metabolic & clinical aberrations, diagnosis, complications, treatment, MNT, dietary counseling and recent advances in:

- Hypertension, dyslipidemia, atherosclerosis, metabolic syndrome, Congestive heart failure
- Cerebro vascular disease and peripheral vascular disease

Gastrointestinal Tract Disorders

Etiopathophysiology, metabolic & clinical aberrations, diagnosis, complications, treatment, MNT, dietary counseling and recent advances in:

- Upper and lower gastrointestinal disorders
- GERD, peptic ulcer, dumping syndrome, irritable bowel syndrome
- Lactose intolerance, celiac disease, inflammatory bowel disease
- Hemorrhoids

THERAPEUTIC NUTRITION

- Assessment of patient needs – nutritional assessment and screening
- Planning and preparation of diets for following diseases
Obesity, Underweight, Type 1 diabetes, Type 2 diabetes, Gestational Diabetes, Hypertension and dyslipidemia, Congestive heart failure, Ulcerative colitis, Lactose intolerance, Celiac disease

PUBLIC HEALTH NUTRITION

Public Health Nutrition

- Aim, scope and content of Public Health Nutrition
- Role of Public Health Nutritionist in National development
- Health – definition, dimensions, determinant and indicators
- National Nutrition Mission – maternal nutrition (antenatal and postnatal care)

Assessment of Nutritional Status of Individual and Community

- Meaning and significance of nutritional status assessment
- Methods of nutritional assessment: Anthropometry, Biochemical and Biophysical methods, clinical methods, dietary intake and ecological variables including socio-cultural, biologic, environmental and economic, and vital health statistics
- Errors in methods of assessing nutritional status
- Rapid assessment procedures for community nutrition assessment

Public Health Aspects of Under nutrition

- Etiology, clinical features, public health implications, preventive strategies for:
 - Chronic Energy Deficiency/Protein Energy Malnutrition and Severe Acute Malnutrition
 - Micronutrient deficiencies - Vitamin A deficiency, Nutritional Anemias, Iodine deficiency disorders, Vitamin D deficiency and Osteoporosis, Zinc Deficiency

Public Health Aspects of Lifestyle related disorders

- Public Health implications and preventive strategies for: Obesity, Hypertension, Cardiovascular diseases, Diabetes

Food and Nutrition Security

- Concepts and definitions of food and nutrition security at the national, regional, house hold and individual levels
- Impact of food production, losses, distribution, access, availability, consumption on food and nutrition security

HUMAN PHYSIOLOGY

Blood and Cardio-Thoracic Physiology

- Blood and Plasma Protein – Composition and Function
- Blood formation and factors controlling Erythropoiesis

- Pathophysiology of Anaemia and Jaundice
- Cardiac cycle, Cardiac output, Heart sounds
- Heart rate & regulation
- Blood pressure, Hypertension
- Coronary Artery Disease
- Hemorrhage; Compensatory changes after hemorrhage
- Transport and exchange of gases
- Control of Respiration and Respiratory function tests
- Lung volume & Capacities and COPD

Excretory Physiology and Exercise Physiology

- Urine formation
- Renal function tests
- Acid Base balance
- Pathophysiology of Renal Stones, Urinary Tract Infection, Glomerulonephritis
- Concept of Fitness, Adaptations to exercise
- Energy Metabolism in Sports
- Overview of Diet and Physical Performance

Gastrointestinal Physiology

- Functions of Stomach, Liver, Pancreas and Gall Bladder
- Composition, function and regulation of: Salivary juice, Gastric juice, Pancreatic juice, Bile juice, Intestinal juice and GI hormones
- Pathophysiological overview of some common diseases in relation to Gastrointestinal Tract (Peptic ulcer/GERD, Cholelithiasis, Portal Hypertension, Fatty liver and Liver Cirrhosis)

Neuro-Endocrine and Reproductive Physiology

- Overview of organization of nervous system
 - Effects of Pituitary, Thyroid, Parathyroid, Adrenal and Pancreatic hormones
 - Pathophysiology of Diabetes Mellitus, Metabolic Syndrome, Hashimoto's disease, Tetany and Cushing Syndrome
 - Physiology of Menstruation and Menopause
 - Physiology of Ageing
 - Physiology of Pregnancy, Lactation
 - Pathophysiology of PCOD and Infertility

NUTRITION COMMUNICATION AND COUNSELLING

Basics of Diet Counseling

- Concept and importance of counseling in the nutrition care process
- Traditional, Current and Emerging methods/tools of counseling
- Skills and attributes of a counselor
- Barriers to effective communication
- Understanding dietary patterns and food choices and their impact on counseling
- Behavior Change Communication and Models for behavior change
- Counseling strategies

Processes Involved in Dietary Counseling

- Managing resources of the communicator/counselor
- Designing of counseling plans—goals & objectives, evaluation instruments.
- Implementation: facilitating self-management of disease condition
- Evaluation: evaluating adherence to dietary changes

Counseling approaches after evaluation

Dietary Counseling through the Life Span

- Considerations for counseling plans for: Prenatal, antenatal and post natal women
- Childhood nutrition problems like: SAM, weight management, vitamin and mineral deficiencies
- School children, adolescents, young adults - Fitness, weight management, eating disorders, nutritional anemia
- Managing diet related chronic diseases in adults: Obesity, Diabetes, Dyslipidemia, Hypertension, Cancer risk prevention, Renal disease, Liver disorders
- Geriatric counseling

Nutritional/Medicinal Role of Traditional Foods, Traditional Food Beliefs

- Role of Ayurveda, Naturopathy, Yoga and other traditional medicines in disease management

SPORTS NUTRITION AND FITNESS

Introduction to Physical Fitness and Sports Nutrition

- Definition & components of physical fitness
- Methods of assessing physical fitness
- Approaches to achieving physical fitness through the lifecycle
- Introduction to Sports nutrition
- Integrated approach to care for athletes

Energy Systems and Fuel for Exercise and Sports

- Energy systems for physical activity and sports
- Continuum of energy
- Fuel utilization for different sports
- Target sports-diets, macro-and micro-nutrient recommendations for sports performance

Nutritional Recommendations for High Performance Athletes

- National Recommendations and nutritional guidelines for different categories of high performance sports
- Nutritional care for Training and day to day recovery
- Nutrition for the Pre-competition, Competition and post competition recovery phase
- Supplements in Sport: performance enhancing substances, drugs, ergogenic aids and herbs in sports performance
- Nutrition for athletes with special needs: vegetarianism, special Olympics, Paralympics

Weight Management in Sports

- Approaches to weight reduction, in weight category sports
- Gain in Lean Body Mass (LBM) for athletic performance
- Management of eating disorders in sports

CLINICAL NUTRITION

Nutrition Care

- Nutrition Support –Parenteral Nutrition
- Diet planning for burn, common liver, Pancreatic, Renal and heart diseases

Hepatobiliary and Pancreatic Disorders & Diet planning

- Etiopathophysiology, metabolic & clinical aberrations, Complications, treatment, MNT
- Nonalcoholic fatty liver disease (NAFLD), Cirrhosis, End stage liver disease (ESLD), Encephalopathy, Liver transplant, Cholecystitis, Cholelithiasis, Pancreatitis

Diseases of Heart and Blood Vessels

- Etiopathophysiology, metabolic & aberrations, complications, prevention, treatment and

MNT

- Myocardial Infarction, angioplasty, heart transplant
- ### **Metabolic Stress and Cancer**

- Metabolic & clinical aberrations, complications, treatment and MNT
- Metabolic Stress-Surgery, Burns and Sepsis, Cancer

Renal Disorders

- Etiopathophysiology, metabolic & clinical aberrations, complications, treatment, MNT in Nephrotic Syndrome, Glomerulonephritis, Acute Renal Failure, Chronic Kidney Disease, End Stage Renal Disease(ESRD), Dialysis, Transplant, Renal Stones.

Neurological Disorders

- Etiopathophysiology, complication, prevention, treatment, MNT in Alzheimer's disease, Parkinson disease

INSTITUTIONAL AND HOSPITAL FOOD MANAGEMENT

Organization and Management

- Management Theories: Classical, Scientific, Systems approach, MBO, JIT, TQM, QWL
- Tools of Management
- Tangible Tools: Organization chart, Job description, Job specification, Job analysis: Path way chart, Process chart, Work schedule, Production schedule, Staff and service analysis, Budget
- Intangible tools: Communication, Leadership, Decision making and its application in hospitals and other food service organizations

Hospital Food Service Management

- Meal Ordering System(manual, electronic)
- Patient menu construction
- Menu card/display
- Food production processes for various situations
- Guidelines of regulatory bodies

INSTITUTIONAL AND RESOURCE MANAGEMENT

Equipments and Layouts in Food Service Units (Hospitals)

- Types of equipments
- Steps in layout planning and architectural features
- Feasibility assessment in terms of layout planning
- Application in hospitals and food service organizations

Food Safety and Hygiene

- HACCP
- GMP, GHP
- Food safety and standard regulations
- Food Safety in different food service units (Hospitals and other catering establishments)-

NUTRITIONAL BIO CHEMISTRY

Carbohydrates

Structures- monosaccharides (glucose, fructose, maltose, galactose); disaccharides(sucrose, maltose, lactose); Polysaccharides (starch and glycogen), Glycolysis and gluconeogenesis and the irregulation, Citric acid cycle and its regulation, Glycogenolysis, Blood sugar regulation by insulin, glucagon and epinephrine, Pentose phosphate pathway

Lipids

Classification of lipids, β -oxidation, *Denovo* synthesis of fatty acids and their elongation, Ketosis, Fatty liver, Lipoproteins-types, synthesis, degradation and clinical significance, Cholesterol-synthesis and regulation

Proteins

Structures of amino acids, Protein structure, Transamination of amino acids, Bio synthesis of Urea

Nucleic Acids

Structure of Nucleotides, Basic structure of nucleic acids (DNA&RNA), Genetic code, Genetic mutations, Protein biosynthesis

Vitamins and Minerals

Role of vitamins and minerals as coenzymes and cofactors, Metabolism of iron and calcium in human body

Clinical Biochemistry

Evaluation/ Interpretation of changes in various biochemical parameters changes in various pathological conditions diseases

FOOD MICROBIOLOGY AND FOOD SAFETY

Basic Microbiology

- Introduction to microbiology
- Characteristics of micro organisms
- Factors effecting microbial growth

Food Spoilage and Preservation

- Foods spoilage
- Principles and methods of food preservation

Beneficial Role of Food Microbes in Health

- Importance of normal flora, prebiotics and probiotics
- Fermentation
- Single cell proteins
- Fermented food products

Food Borne Microbial Diseases

- Public health hazards: Food borne infections and intoxications
- Symptoms, mode of transmission and methods of prevention
- Emerging food pathogens

Food Safety and Quality Control

- Food hazards
- Concept of risk analysis
- Concept of Food Safety Management System, GHP and GMP
- HACCP,ISO22000
- Accreditation and Auditing
- Food Laws, Regulations and Standards

FOOD SAFETY TECHNIQUES

- To Study Morphology and Structural Features of Various Micro-organisms – Simple staining, Differential staining
- To Study the Various Techniques and Instruments Used in Microbiology - Sterilization and Disinfection, Filtration, bio safety cabinets, Chemical methods (Ethanol and Antibiotics)
- Isolation of Microorganisms Pure Culture Technique , Standard Plate Count Method
- Microbiological Analysis For- Water (Most Probable Number), Milk (Methylene Blue Reduction Test), Curd and probiotic count, Adulteration test for various food products
- Assessment of Sanitation and Hygiene- Swab and Rinse technique, Assessment of personal hygiene

POLICIES AND PROGRAMMES IN PUBLIC HEALTH NUTRITION

Approaches and Strategies for Improving Nutritional and Health Status

- Health based interventions including immunization, provision of safe drinking water/sanitation, prevention and management of diarrheal diseases
- Food based interventions including fortification, use of biotechnology, supplementary feeding
- Education based interventions including growth monitoring and promotion, communication for health and nutrition behavior change

National Policies for Promotion of Nutrition and Health Status of the Population

- National Nutrition Policy and National Nutrition Mission
- National Food Security Act
- National Health policy
- Population policy
- National water policy
- National Urban Sanitation Policy

National Nutrition and Health Programmes

- Components, administration and evaluation of programmes for prevention and control of micronutrient deficiencies and improving food and nutrition security

Nutritional Surveillance

- Objectives, initial assessment indicators for use in nutrition surveillance
- Nutritional surveillance for programme planning: Triple approach

Programme Planning

Diagnosis of situation, setting of objectives, suitability and relative costs of various strategies, implementation, monitoring and evaluation