



آیت نمبر 25-28

قرآنی دعائیں

سورۃ غلط

رَبِّ اشْرَحْ لِي صَدْرِي ۝ وَيَسِّرْ لِي أَمْرِي ۝
وَاحْلُلْ عُقْدَةً مِّن لِّسَانِي ۝ يَفْقَهُوا قَوْلِي ۝

پروردگار، میرا سینہ کھول دے، اور میرے کام کو میرے لیے
آسان کر دے اور میری زبان کی گرہ سلجھا دے تاکہ لوگ میری
بات سمجھ سکیں

رَبِّ زِدْنِي عِلْمًا

MY LORD! INCREASE ME IN KNOWLEDGE.

FAN-705. DIETETICS AND APPLIED NUTRITION 3(2-1)

Spring-2020

M. Sc. (Hons). Food and Nutrition
Semester-II (R)
Session: 2019-2021

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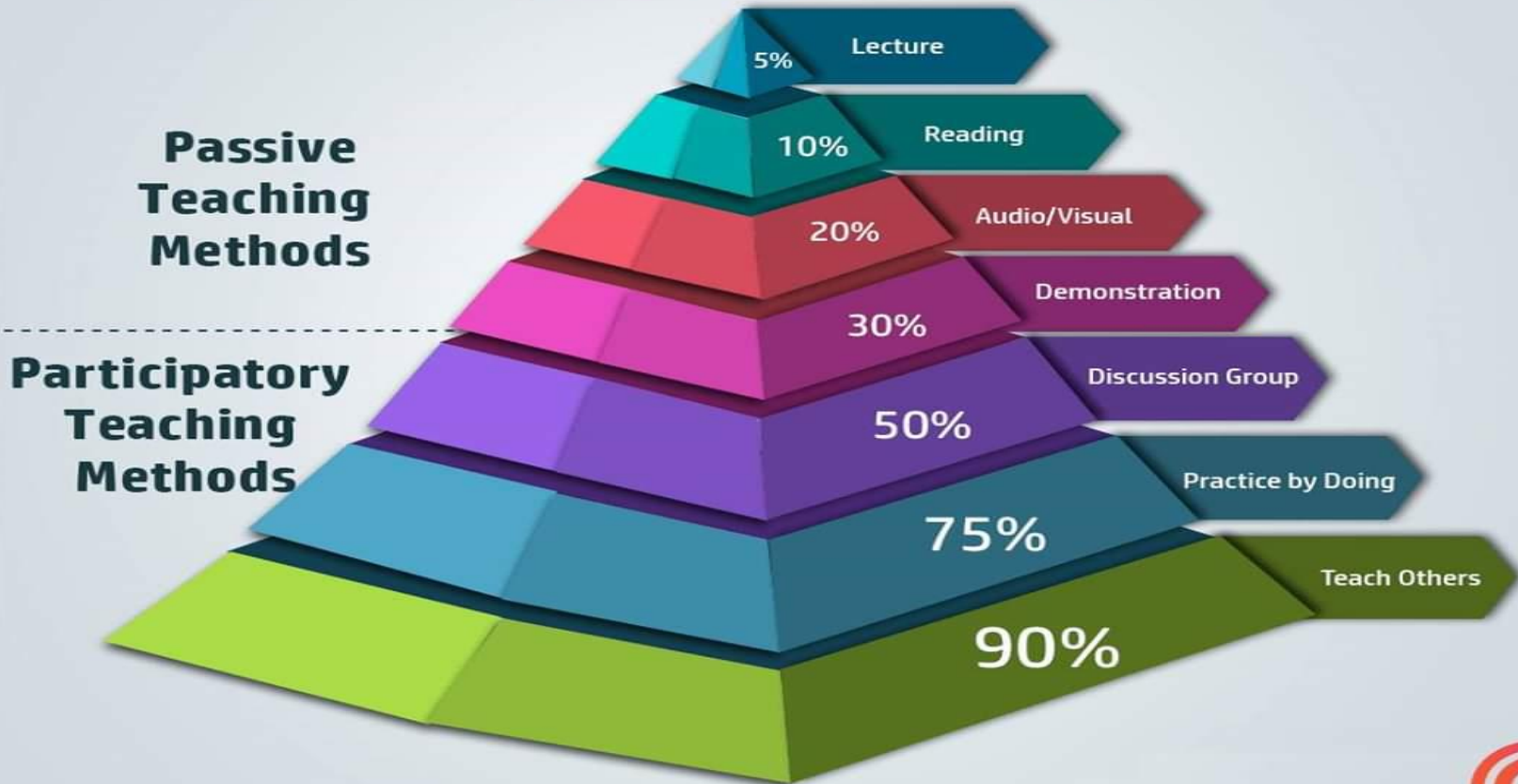
FAN-705. L # 1. COURSE INTRODUCTION

- Teaching and Learning Method
- Basic Info
- Marks Distribution
- Course Contents
- Books Recommended

STUDENTS' AVERAGE RETENTION RATES

THE LEARNING PYRAMID

KNOWLEDGE RETENTION RATES



Adapted from National Training Laboratories, Maine



REFERENCE

NATIONAL TRAINING LABORATORIES, MAINE

**BETHEL IS A TOWN IN OXFORD COUNTY,
MAINE, UNITED STATES**

(Audio-Videos Methods in Teaching, 1954)

Session	2019- 2021		
Academic Year	Spring-2020		
Course Teacher	Dr. Shahid Mahmood Rana		
Program	M. Sc. (Hons). Food and Nutrition		
Semester	II		
Section	Regular		
Course Code	FAN-705		
Course Title	Dietetics and Applied Nutrition		
Credit Hours	3 (2-1)		
Paper	Theory + Practical		
Commencement			
Exams	Mid Term		Final Term

MARKS DISTRIBUTION ??

SEGMENT	MARKS
MID TERM	30
FINAL TERM	50
SESSIONAL (QUIZ, WRITTEN TESTS, ASSIGNMENTS, PRESENTATIONS 2-EACH)	20
TOTAL LECTURES	48
COMPULSORY LECTURES (75 %)	36

Theory

Nutritional and health status assessment: anthropometry, medical history and clinical examination, biomarkers interpretations. Conventional and modern approaches for diet therapy and nutritional science

Nutritional programs and strategies for high risk population

Dietary calculations

Nutrition medicines and complementary therapies

Nutrition interventions

Nutrition care plan: standard and modified diets

Practical

Training in diet department of hospital and monitoring the patients to study their nutritional problems

Recommended Books

- Shubhangini AJ. 2010. **Nutrition and Dietetics**. 3rd Ed. Tata McGraw-Hill. New Delhi, India.
- Watkins BC. 2009. **Hand Book of Clinical Nutrition and Aging**. 2nd Ed. Human Press. USA.
- Gibson RS. 2005. **Principles of Nutritional Assessment**. 2nd Ed. Oxford University press Inc. Mddision Avenue, New York, USA.
- Rolandelli RH, Bankhead R, Boullate JI and Compher CW. 2005. **Clinical Nutrition; Enteral and Tube Feeding**. 4th Ed. Elavier Sauders Publishers, USA.

FAN-705. L # 2. DAN BASICS

- Bromatology
- Nutrition
- Food
- Diet
- Health

BROMATOLOGY

- Bromatology (interchangeable term with food science and food technology) is a field that **integrates** a wide array of **disciplines** associated to the **science** of food, food-derived **products** and food related **aspects**.
- The science of foods, from the **Greek *broma*, food**.
- Bromatology is the **science** of **food** and **nutrition**

NUTRITION

“The science of **foods** and their components (**nutrients** and other **substances**) including the relationships to **health** and **disease** (actions, interactions, and balances); **processes** within the body (ingestion, digestion, absorption, transport, functions, and disposal of end products); and the **social, economic, cultural** and **psychological** implications of eating.”

(Paul Insel, R. Elaine Turner and Don Ross. 2004. Nutrition. 2nd Ed. Jones and Bartlett Publishers, Inc.

USA (pp: 4)

NUTRITION

“The science of **foods** and the **nutrients** and other **substances** they contain, and of their **actions** within the **body** (including ingestion, digestion, absorption, transport, metabolism, and excretion); a broader definition includes the **social, economic, cultural, and psychological** implications of **food** and **eating**”.

(Sharon Rady Rolfes, Kathryn Pinna and Ellie Whitney. 2009. **Understanding Normal and Clinical Nutrition. 8th Ed.** Wadsworth, Cengage Learning, USA.)

NUTRIENTS

Nutrients

“**Chemical** substances obtained from **food** and used in the body to provide **energy**, **structural** materials, and **regulating** agents to support **growth**, **maintenance**, and **repair** of the body’s tissues. Nutrients may also reduce the **risks** of some **diseases**”.

Essential Nutrients

“Nutrients a person must obtain from food because the body cannot make them for itself in sufficient quantity to meet physiological needs; also called **indispensable nutrients**”.

- About **40 nutrients** are currently known to be essential for human beings.

(Sharon Rady Rolfes, Kathryn Pinna and Ellie Whitney. 2009. Understanding Normal and Clinical Nutrition. 8th Ed. Wadsworth, Cengage Learning, USA.)

FOOD ?

- “Food is a **substance** that after **ingestion** and **digestion** may provide materials for **energy, growth, development, maintenance** and/or **repair of cells/ tissues/ organs/ systems/ organism**”.
- It is usually of **plant** or **animal origin**, and contains essential nutrients, such as **carbohydrates, fats, proteins, vitamins, or minerals** and/or **water**.

(Robert A. Ronzio. 2003. The Encyclopedia of Nutrition and Good Health. 2nd Ed. Facts on File, Inc. 132 West 31st Street, New York NY 1000)

FOOD ?

- The substance is **ingested** by an organism and **assimilated** by the organism's cells in an effort to produce **energy**, **maintain life**, or **stimulate growth**.
- **Products** derived from **plants** or **animals** that can be taken into the body to yield **energy** and **nutrients** for the maintenance of life and the growth and repair of tissues.

(Robert A. Ronzio. 2003. The Encyclopedia of Nutrition and Good Health. 2nd Ed. Facts on File, Inc. 132 West 31st Street, New York NY 1000)

BODY REQUIREMENT FOR NUTRIENTS

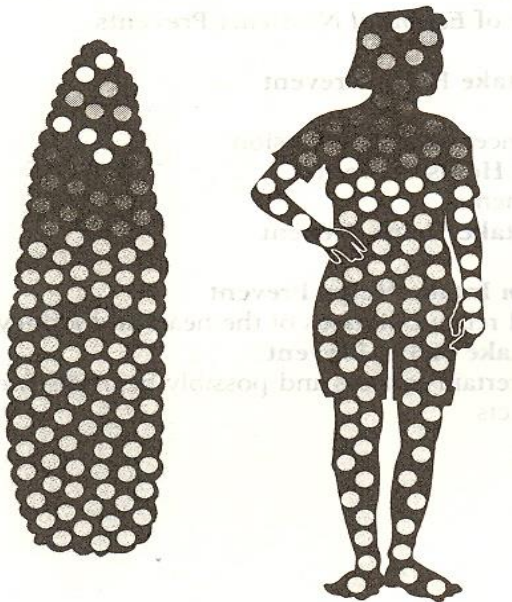
Organic

- Carbohydrate
- Fats
- Protein
- Vitamins

**Energy Yielding
Nutrients**

- Minerals
- Water

**The Human Body and Foods are
made of the Same Materials,
Arranged in different Ways.**



FUNCTIONAL FOODS

- Foods that contain **physiologically active** compounds that provide **health** benefits beyond their **nutrient** contributions.
- Sometimes called *designer foods* or *nutraceuticals*.

(Sharon Rady Rolfes, Kathryn Pinna and Ellie Whitney. 2009. Understanding Normal and Clinical Nutrition. 8th Ed. Wadsworth, Cengage Learning, USA.)

NUTRITIOUS FOOD ?

- Providing **nourishment**, especially to a high degree; nourishing; **healthful**
- **Firstly, healthy food** consists of all the essential nutrients like **proteins, carbohydrates, lipids, minerals vitamins** and **water**
- **Secondly**, it is **hygienic** and **doesn't** contain any **germs / toxins**
- **Thirdly**, it should include all **sorts (variety)** of eatables like veggies, fruits, meat, dairy, sweets etc. in right proportion
- In a **nutshell**, healthy food keeps the **body fit** and at its **top**

(Ronzio, R A. 2003. The Encyclopedia of Nutrition and Good Health. 2nd Ed. Facts on File, Inc. 132 West 31st Street, New York NY 1000)

FOOD AS DIET

- The **foods** and **beverages** a person **eats** and **drinks**.
- The food that is **selected** due to some **cause/reason/objective** and may be consumed **regularly**.
- The **quality** of which affects **health** and the risk of **chronic** diseases.
- The word “diet” is derived from the **Greek** word “**diatia**” which means “**manner of living**”.

(Sharon Rady Rolfes, Kathryn Pinna and Ellie Whitney. 2009. Understanding Normal and Clinical Nutrition. 8th Ed. Wadsworth, Cengage Learning, USA.)

BALANCED DIET

- The diet that may furnish bodily requirements of an individual.
- Balanced diet is an individual's specific.

(Sharon Rady Rolfes, Kathryn Pinna and Ellie Whitney. 2009. Understanding Normal and Clinical Nutrition. 8th Ed. Wadsworth, Cengage Learning, USA.)

DIET & BALANCED DIET

Diet

“The **foods** and **beverages** a person **eats** and **drinks**”.

“In nutrition, diet is the sum of food consumed by a person or other organism”.

Balanced Diet

“The diet that may **furnish** bodily **requirements** of an **individual**”.

Dietitian

“A **person** trained in **nutrition**, **food science**, and **diet planning**”.

(Sharon Rady Rolfes, Kathryn Pinna and Ellie Whitney. 2009. Understanding Normal and Clinical Nutrition. 8th Ed. Wadsworth, Cengage Learning, USA.)

HEALTHY DIET & MEDICAL DIET

Healthy Diet

“A healthy diet helps to **protect** against **malnutrition** in all its **forms**, as well as non-communicable diseases (**NCDs**), including such as diabetes, heart disease, stroke and cancer”.

“**Adequacy**, **Variety**, and **Balance** are key **characteristics** of a **healthy** diet”.

Medical Diet

“A **prescribed** course of **eating** and **drinking** in which the **amount** and **kind** of food, as well as the **times** at which it is to be taken, are regulated for **therapeutic** purposes”.

HEALTH ??

“Health is a **state** of complete **physical, mental** and **social well-being** and **not** merely the **absence of disease** or **infirmity**”.

(WHO, 1946...)

(Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, N.Y., 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948.)

FAN-705. L # 3. FACTORS FOR SELECTION FOOD AS DIET

- Factors / Causes

FACTORS FOR SELECTION FOOD AS DIET

- Religious teachings / guides
- Age
- Gender
- Climate
- Weather
- Economy
- Physical status / Medical conditions
- Physical activity
- Socio economic status
- Life style
- Eating habits

FACTORS FOR SELECTION FOOD AS DIET..

- Social Pressure
- Emotional Comfort
- Availability / Convenience
- Accessibility
- Affordability
- Convenience
- Nutrition and Health Benefits
- Prescribed Foods
- Prescription / Family / Friends
- Body weight and Image
- Nutrition and Health benefits

FACTORS FOR SELECTION FOOD AS DIET..

- Personal preferences / Liking and disliking
- Positive and negative associations
- Ethnic heritage
- Culture
- Traditions
- Values
- Norms
- Customs
- Festivals
- Media / Marketing

FAN-705. L # 4. PRINCIPLES OF HUMAN NUTRITION

10 PRINCIPLES OF HUMAN NUTRITION

1. Food is a **basic need** of humans
2. Foods provide **energy** (calories), **nutrients**, and other **substances** needed for **growth** and **health**
3. Health **problems** related to **nutrition originate** within **cells**
4. **Poor nutrition** can result from both **inadequate** and **excessive** levels of nutrient intake
5. Humans have **adaptive mechanisms** for managing **fluctuations** in food intake

10 PRINCIPLES OF HUMAN NUTRITION

6. **Malnutrition** can result from **poor diets** and from **disease** states, **genetic** factors, or **combination** of these causes
7. Some groups of people are at **higher risk** of becoming **inadequately nourished** than others
8. **Poor** nutrition can influence the **development** of certain **chronic diseases**
9. **Adequacy, variety,** and **balance** are key characteristics of a **healthy diet**
10. **There are no "good" or "bad" foods**

FAN-705. L # 5. NS, NHS & NSA

- Nutrition Status
- Nutritional Health Status / Nutritional Status
- Nutritional Health Status Assessment /
Nutritional Status Assessment

NUTRITIONAL HEALTH STATUS / NUTRITIONAL STATUS

- “Nutritional status is the balance between the intake of nutrients by an organism and the expenditure of these in the processes of growth, reproduction, and health maintenance”.

(Assessment of Nutritional Status." Encyclopedia of Food and Culture . . Retrieved March 18, 2020 from Encyclopedia.com: <https://www.encyclopedia.com/food/encyclopedias-almanacs-transcripts-and-maps/assessment-nutritional-status>)

- “Nutritional health status is the condition of **health** as it is related to the use of **food** by the body”.

(Weighly *et al.*, 1997)

NUTRITIONAL HEALTH STATUS ASSESSMENT

“Nutritional health status assessment includes food intake analysis, body composition assessment, biomarkers’ laboratory tests, anthropometrics, review of medications, lifestyle and fitness indicators”

(Gibson, 1990)

ABCDE OF NUTRITIONAL HEALTH ASSESSMENT

- **Anthropometrics** Assessment
- **Biochemical** Assessment
- **Clinical** Assessment
- **Dietary** Assessment
- **Ecological / Environmental** Assessment

ABCDE OF NUTRITIONAL HEALTH ASSESSMENT

Anthropometrics Assessment

- Measurement of body weight and the lengths, circumference, and thicknesses of parts of the body

Biochemical Assessment

- Measurement of biochemical functions (e.g, concentrations of nutrient by products or enzyme activities in the blood or urine) related to a nutrient's function

Clinical Assessment

- Examination of general appearance of skin, eyes, and tongue; evidence of rapid hair loss; sense of touch; and ability to cough and walk

Dietary Assessment

- Estimation of typical food choices, relying mostly on the recounting of one's usual intake or a record of one's previous days' intake

Environmental Assessment

- Includes details about living conditions, education level, and the ability of the person to purchase, transport, and cook food. The person's weekly budget for food purchases is also a key factor to consider

NUTRITIONAL ASSESSMENT

- “Nutritional assessment is a **comprehensive** review of nutritional **status** that employs **medical, nutritional, and medicinal** history, **physical** examination, and **anthropometric** and **laboratory** data to **diagnosis** nutritional **problems**”.

(Mueller *et al.*, 2011)

Nutrition assessment

Nutrition assessment is a comprehensive review of nutritional status that employs medical, nutritional, and medicinal history, physical examination, and anthropometric and laboratory data to diagnosis nutritional problems (Mueller *et al.*, 2011). Currently, there is no 'gold standard' for assessing and diagnosing nutritional depletion

FAN-705. L # 6. NSIL & NSA TOOLS

- Nutrition Screening Initiative Level I & II
- Tools
 - Subjective Global Assessment (SGA)
 - Assessment Lexicon: ABCDEF

Nutrition Screening Initiative level I and II screens

The NSI LI screen, to be administered by a health or social service professional, provides information on possible signs of nutritional risk. If it indicates possible risk, then a physician or qualified health professional performs a level I (LII) screen in a clinical setting by completing a comprehensive review of the patient's nutritional status, including diagnostic material. Although this portion of NSI is termed the 'LI and LII screen', the detailed nature of tier 2 actually qualifies it as a nutrition assessment tool. To date neither tier has been validated; until they are, other methods may be more appropriate.

Subjective Global Assessment

The Subjective Global Assessment (SGA) tool was first developed in 1982 as a tool for clinicians to assess a patient's nutritional status, particularly wasting and protein–energy malnutrition, at the bedside without need to have detailed information on body composition. Components of the assessment include a history and physical examination. The section on history considers weight and dietary intake changes, gastrointestinal symptoms, functional capacity or energy level and disease as it relates to nutritional status. The physical examination notes the presence of oedema, ascites, muscle wasting and the loss of subcutaneous fat. All information from the assessment is combined to provide a letter grade of A (well nourished), B (suspicion of malnutrition) or C (severely malnourished) being assigned to the patient.

Assessment **Lexicon: ABCDEF**

Another tool for individual **nutritional** assessment is the mnemonic '**ABCDEF**' that cues the clinician to indicators that comprise the core elements of nutrition assessment. The included elements are anthropometry, biochemical data, clinical observations, dietary intake (and use of drugs/medications), extra information (such as exercise and physical activity patterns, socio-economic, family and cultural issues) and **functional status** (Dwyer, 2001).

Citation: NUTRITIONAL STATUS LEXICON: ABCDEF's

- Powers JS . 2002. Facilitated feeding in disabled elderly. *Curr. Opin. Clin. Nutr. Metab. Care.* 5(3): 315-319.
- Dwyer, J. T. 2001. An assessment lexicon: assessment of dietary trends, physical activity patterns and nutritional status in the elderly. *The Journal of Nutrition, Health & Aging.* 5(2): 108-112.

NUTRITIONAL ASSESSMENT LEXICON: ABCDEF

- A Anthropometry
- B Biochemical Data
- C Clinical Assessment (signs and symptoms-medical condition)
- D Dietary and Drug History
- E Extra Information / Environment (exercise & physical activity, social, family, culture, religion)
- F Functional Status (ADLs & IADLs)

Dwyer, J. T. (2001). An assessment lexicon: assessment of dietary trends, physical activity patterns and nutritional status in the elderly. *The journal of nutrition, health & aging*, 5(2), 108-112.

Judith L. Buttriss, Ailsa A. Welch, John M. Kearney, Susan A. Lanham-New. 2017. *Public Health Nutrition*. John Wiley & Sons. P: 186-87



Definition of ADL and IADL

- ***Activities of daily living (ADL)***
 - Activities that are oriented toward taking care of one's own body.¹
- ***Instrumental activities of daily living (IADL):***
 - Activities that are oriented toward interacting with home and community environments. They are often complex in nature than ADL.¹

Definitions from the Occupational Therapy Practice Framework, 2nd ed. (American Occupational Therapy Association, 2008).

ADLs & IADLs

Activities of Daily Living (ADLs)	Instrumental Activities of Daily Living (IADLs)
Feeding Contenance Transferring Toileting Dressing Bathing	Using the telephone Shopping Preparing food Housekeeping Doing laundry Using transportation Handling medications Handling finances



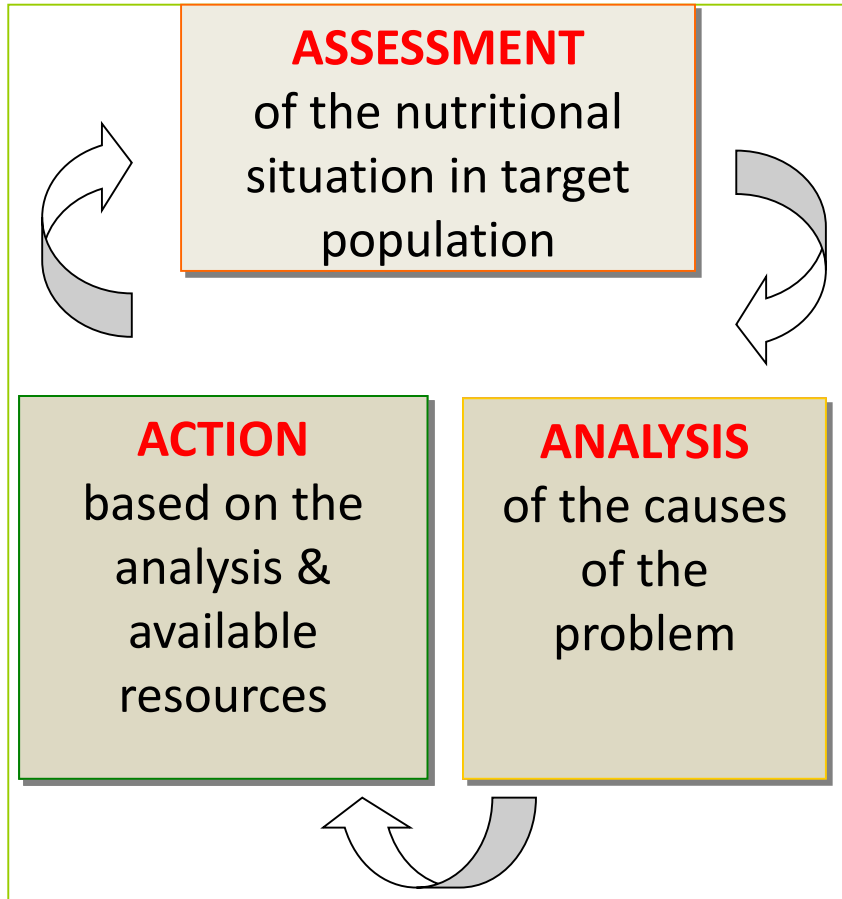
Functional Assessment

- Activities of Daily Living (ADLs)
 - Feeding
 - Dressing
 - Ambulating
 - Toileting
 - Bathing
 - Transferring
 - Contenance
 - Grooming
 - Communication
- Instrumental ADL (IADLs)
 - Cooking
 - Cleaning
 - Shopping
 - Meal preparation
 - Telephone use
 - Laundry
 - Managing money
 - Managing meds
 - Ability to travel

FAN-705. L # 7. NSA & TRIPLE A CYCLE

- NSA
- Triple A Cycle
- Study Designes

NHS ASSESSMENT



To define the nutritional problem of the targeted population, it is necessary to **measure its nutritional status**

Nutritional Status Assessments enable to determine whether the individual is well-nourished or undernourished

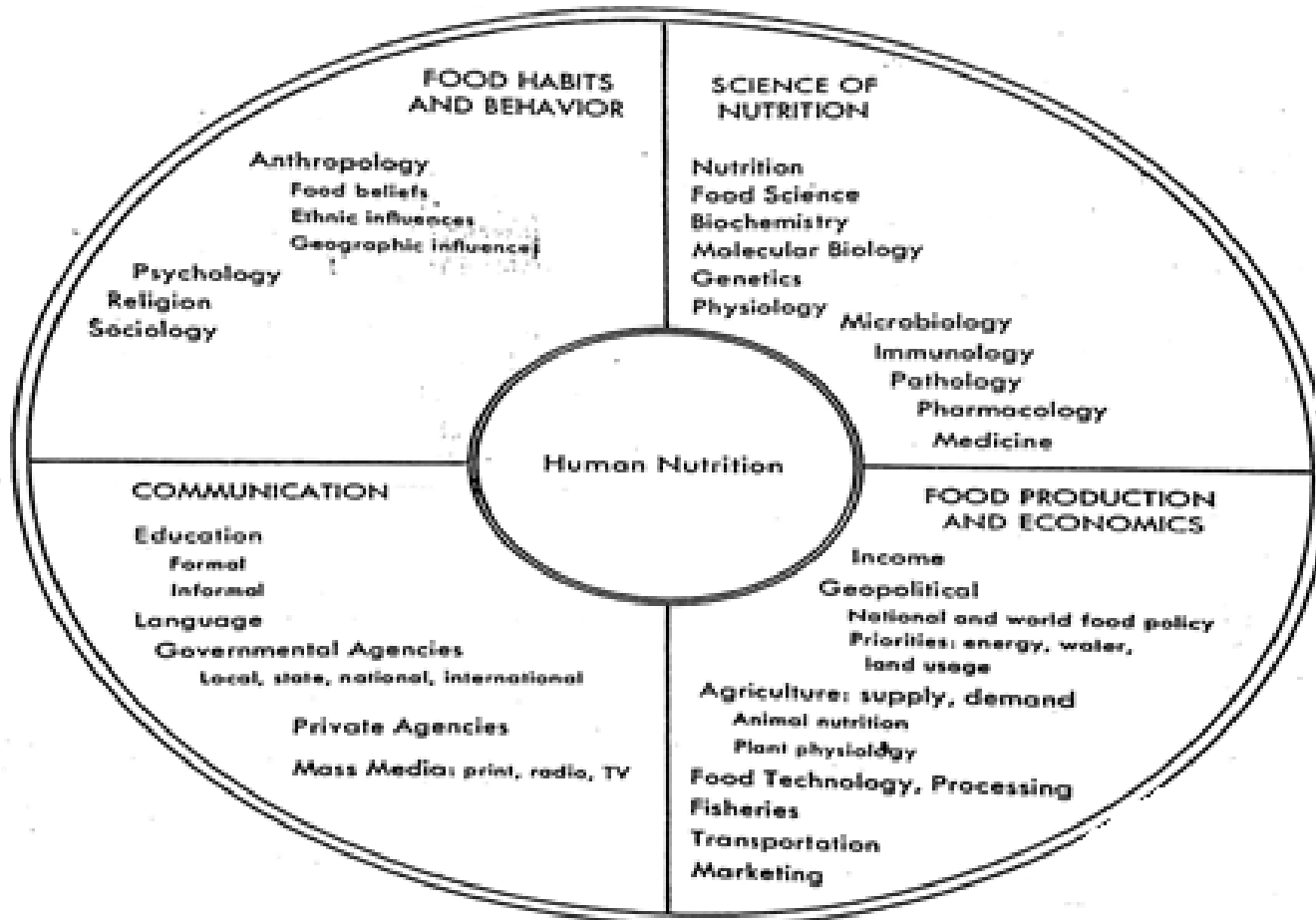
Source: TRIPLE A CYCLE (adopted from UNICEF, 1998)

Study design	Name/ alternative name	Description	Advantages	Disadvantages
Intervention study	Randomised controlled trial/ clinical trial	Comparison of event rates, behaviour and risk factor changes in individuals or groups of people exposed to an intervention (e.g. dietary advice) with a control or comparison group	Low probability of selection bias, recall bias, confounding Pilot policy change by comparing effect of new and old policies Demonstrate effectiveness	Risks of bias due to loss to follow up High time and cost requirements Educational and behavioural interventions are difficult to conceal. Resulting 'contamination' distorts observed effect sizes
Cohort study	Prospective study Follow-up study Longitudinal study	Measurement of exposures (e.g. dietary intake) with follow up over time for incident events/risk factor status Studies relationships between exposures and outcomes	Prospective study avoids recall bias Can study multiple exposures Obtain direct measures of incident disease/outcomes Observe time sequences and relationships Control for possible multiple confounders	Risks of bias due to loss to follow up High time and cost requirements Requires large sample size Difficult to eliminate confounding between correlated exposures (e.g. nutrient intakes)
Cross-sectional study	Health survey	Measurement of exposures, risk factors and disease prevalence at one point in time Studies relationships (associations) between exposures and outcomes	Low probability of selection bias, recall bias Study multiple exposures and outcomes Can control for possible multiple confounders	Requires large sample sizes Temporality of associations is not known Cannot measure incidence
Case-control study	Case-reference	Comparison of group of identified cases with a group of healthy controls. Exposure is measured retrospectively Compares level of past exposure (e.g. diet) in cases and controls	Smaller sample size than cohort study Low time and cost requirements Prospective case-control studies are possible	High probability of selection bias, recall bias, confounding. Potentially low reliability of findings Temporality of associations often not known Can only test one outcome
Ecological study	Correlational	Investigates the relationship between exposure and disease in grouped data (e.g. regions, countries)	Low time and cost requirements High potential for investigating causes of rare diseases	Inaccuracy of data Ecological fallacy: confounding cannot be controlled

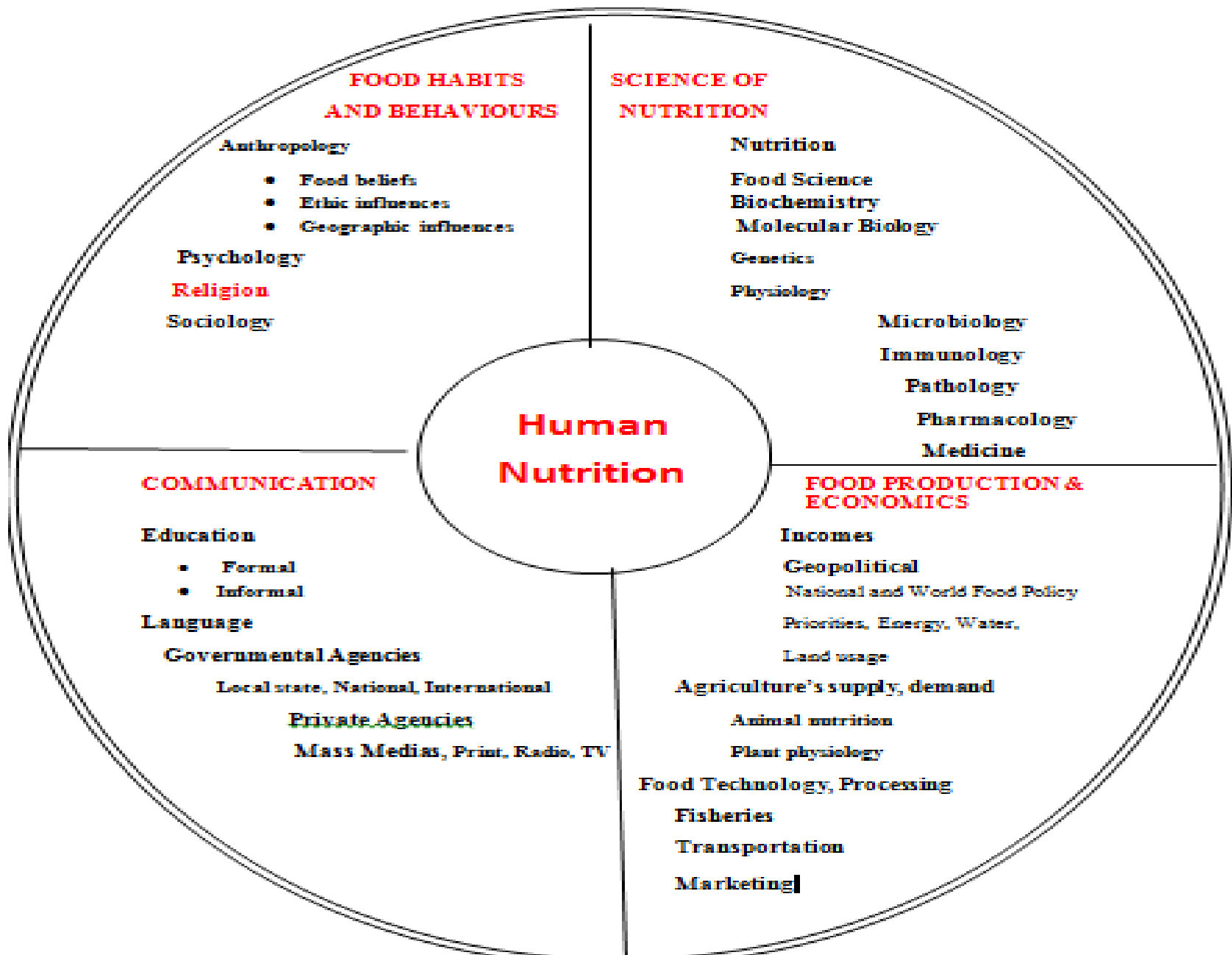
Source: adapted from Bonita *et al.* (2006) and Thiese (2014).

FAN-705. L # 8. HUMAN NUTRITION AND OTHER DISCIPLINES

HUMAN NUTRITION AND OTHERS



(Wal, S. and R. Mishra (eds). 2000. Encyclopaedia of Health, Nutrition and Family Welfare (Vol-I). 1st Ed. Sarup & Sons. New Delhi-110002)



FAN-705. L # 9. CLINICAL NUTRITION

- Clinical Nutrition and ICDM
- Clinical Nutrition / Dietetics / Medical Nutrition Therapy / Nutrition Therapy
- Dietitian / Clinical Nutritionist / Registered Dietitian / Registered Dietitian Nutritionist
- Applied Nutrition
- Dietetics

CLINICAL NUTRITION AND ICDM?

Integrated Chronic Disease Management

- Simultaneous use of all the proper, possible and suitable methods to manage a disease.
- Integrated chronic disease management (ICDM) is a responsive, person centered, effective system of care that aims to improve health outcomes and the quality of life for people with chronic disease.
- It involves services working with each other and people with chronic diseases to ensure coordination, consistency and continuing care over time and through the different stages of a person's condition.
- **“The management and delivery of health services so that clients receive a continuum of preventive and curative services, according to their needs over time and across different levels of the health system.” (WHO, 2008)**

CLINICAL NUTRITION / DIETETICS / MEDICAL NUTRITION THERAPY / NUTRITION THERAPY

- Medical Nutrition Therapy (MNT) is a **therapeutic** approach to **treating** medical conditions and their associated symptoms via the use of a specifically **tailored** diet **devised** and **monitored** by a **Physician** or **Registered Dietitian** (RD).
- The diet is based upon the patient's **medical record**, **physical** examination, **functional** examination and dietary **history**.

CLINICAL NUTRITION / DIETETICS / MEDICAL NUTRITION THERAPY / NUTRITION THERAPY

- Medical Nutrition Therapy (MNT) is the use of specific **nutrition services** to treat an illness, injury, or condition.
- It was introduced in **1994** by the **American Dietetic Association (AND: Academy of Nutrition and Dietetics)** to better articulate the nutrition therapy process.

CLINICAL NUTRITION / DIETETICS / MEDICAL NUTRITION THERAPY / NUTRITION THERAPY

- It involves the assessment of the **nutritional status** of the client and the actual treatment, which includes nutrition **therapy, counseling,** and the use of specialized nutrition **supplements**
- "Registered dietitians started using MNT as a dietary intervention for preventing or treating other health conditions that are caused by or made worse by unhealthy eating habits.

CLINICAL NUTRITION / DIETETICS / MEDICAL NUTRITION THERAPY / NUTRITION THERAPY

- **Skipper, Annalynn (2009-10-07). Advanced Medical Nutrition Therapy Practice. Jones & Bartlett Learning. p. 50. ISBN 9780763742898.**
- **"RDNs and Medical Nutrition Therapy Services". eatright.org. 12 June 2014. Retrieved 3 May 2016.**
- **Sara F., Morris, et all. "Medical Nutrition Therapy: A Key to Diabetes Management and Prevention". clinical.diabetesjournals.org. Retrieved 3 May 2016.**
- **"Medical Nutrition Therapy: Definition & Uses". study.com. Retrieved 3 May 2016.**
- **American Dietetic Association (2000). Manual of Clinical Dietetics, 6th ed. Chicago, IL: Author.**
- **Florida Dietetic Association (2002). The Florida Dietetic Association Handbook of Medical Nutrition Therapy: The Florida Diet Manual. Tallahassee, FL: Author.**

DIETITIAN / CLINICAL NUTRITIONIST / REGISTERED DIETITIAN / REGISTERED DIETITIAN NUTRITIONIST

- **A person trained in Nutrition, Food Science, and Diet Planning.**

(Sharon Rady Rolfes, Kathryn Pinna and Ellie Whitney. 2009. Understanding Normal and Clinical Nutrition. 8th Ed. Wadsworth, Cengage Learning, USA.)

- **“A dietitian is a person with a qualification in nutrition and dietetics recognised by national authority[s]. The dietitian applies the science of nutrition to the feeding and education of groups of people and individuals in health and disease.”**

(Accepted by 34 dietetic association members of the ICDA on May 29th 2004, Chicago Revised June 2015)

APPLIED NUTRITION ??

“Putting to use **general principles** of the **science** of human **nourishment** to address or **solve** specific **problems**”.

DIETETICS ??

“The **integration** and **application** of **principles** derived from the disciplines of **food, nutrition, management, communication, biological, physiological, behavioural and social sciences** to **achieve** and **maintain** human **health**”.

“The **science** or **art** of applying the principles of **nutrition** to the **diet**”.

“Dietetics is essentially the **communication** and **explanation** of the **science** of **nutrition** and the **physiological responses** of our **bodies** to the **food** that we **consume**”.

FAN-705. L # 10. NUTRITION & LAWS

- DRAP ACT – 2012
- PHC ACT-2010
- Food Supplements
- Medical / Health Devices
- Traditional Chinese Medicines

DRAP ACT - 2012

DRUG REGULATORY AUTHORITY OF PAKISTAN (DRAP) - DRAP ACT 2012

- The Drug Regulatory Authority of Pakistan (DRAP) has been established under the DRAP Act 2012 to provide effective coordination and enforcement of the Drugs Act, 1976 (XXXI of 1976) and to bring harmony in inter-provincial trade and commerce of therapeutic goods

PHC ACT-2010

THE PUNJAB HEALTHCARE COMMISSION (PHC) - PHC Act 2010

- The Punjab Healthcare Commission (PHC) is an autonomous health regulatory body established under the PHC Act 2010.
- The PHC aims to improve the quality, safety and efficiency of healthcare service delivery for all public and private healthcare establishments (HCES) including Allopath's, Homeopaths and Tibbs in the province of Punjab
- THE PHC is responsible for developing and enforcing Minimum Service Delivery Standards (MSDS) at all levels of healthcare, to improve the quality of healthcare services and foster a culture of clinical governance. all healthcare establishments are required to implement MSDS to acquire a license to deliver healthcare services in PUNJAB

FOOD SUPPLEMENTS ??

“A dietary supplement is a **product** intended for **ingestion** that contains a **dietary ingredient** intended to add further **nutritional value** to (supplement) the **diet**”.

(Food and Drug Administration, 2015)

“As an addition to a normal diet, food business operators market food supplements, which are **concentrated sources** of **nutrients** (or other substances) with a **nutritional** or **physiological effect**”.

(European Commission, 2015)

FOOD SUPPLEMENTS ??

- Dietary supplements may be found in many forms such as tablets, capsules, soft gels, gel caps, liquids, or powders
- Some dietary supplements can help ensure get an adequate dietary intake of essential nutrients
- Others may help you reduce risk of disease

(Food and Drug Administration, 2015)

MEDICAL / HEALTH DEVICES ??

“An article, instrument, apparatus or machine that is used in the prevention, diagnosis or treatment of illness or disease

or

used for detecting, measuring, restoring, correcting or modifying the structure or function of the body for some health purpose”.

(World Health Organization, 2012)

TRADITIONAL CHINESE MEDICINES (TCM)

“A broad range of **medicine** practices sharing common concepts which have been developed in **China** and are based on a tradition of more than **2,000** years, including various forms of **Herbal Medicine, Acupuncture, Massage** (Tui na), **Exercise** (Qigong), and **Dietary Therapy.**”

(National Institute of Health, 2013)

A COMPLETE GUIDLINE
&
RESEARCH METHODOLOGY
FOR
NHS ASSESSMENT

A CASE STUDY

ASSESSMENT OF NUTRITIONAL HEALTH STATUS

OF UNIVERSITY GIRLS: A COHORT STUDY

COHORT STUDY

- A cohort study is a form of **longitudinal/observational** study used in **nutrition**, **medicine**, social science, actuarial science, business analytics, and ecology
- A type of research used to investigate the **causes** of disease, **establishing** links between **risk factors** and **health outcomes**
- An analytical study in which individuals with differing **exposures** to a **suspected factor** are **identified** and then **observed** for the occurrence of certain **health effects** over some period, commonly years rather than weeks or months

(Miquel, 2008; Blumenthal *et al.*, 2001)

OBESITY'S GLOBAL STATISTICS

- **2.1 billion** people (**30%** of world population) are overweight or obese costs **15%** of health care budget in developed economies
- **671 million** people now fall within obese category
- **1.6 billion** adults are overweight across the globe that will grow by **40%** till **2030** as stated by WHO
- Globally, **42 million** preschool children were overweight in 2013
- Obesity's global costs hit **\$ 2 trillion** a year
- Obesity's impact at **2.8%** of global **GDP**

(Dobbs, 2014)

OBESITY'S GLOBAL STATISTICS

- The study, based on data from **188** countries, said the prevalence of **obese** and overweight **adults** grew by **28 %** worldwide, and by nearly **50 %** for **children**
- For **men**, the increase was from **29** to **37 %** and for **women** from **30** to **38 %** of the population
- The study authors expressed concern that nearly a **quarter** of **kids** in **developed** countries and **13 %** in **developing** ones were overweight or obese

(The Lancet, 2014)

OBESITY'S PAKISTAN STATISTICS

- **NNS-2011** reported that **19%** Pakistanis were overweight while **10%** were obese
- Pakistan ranked **9th** out of **188** countries in terms of obesity, according to the Global Burden of Disease Study published in **The Lancet** medical journal (2014) while **USA, China & India** ranked **1st, 2nd & 3rd**, respectively

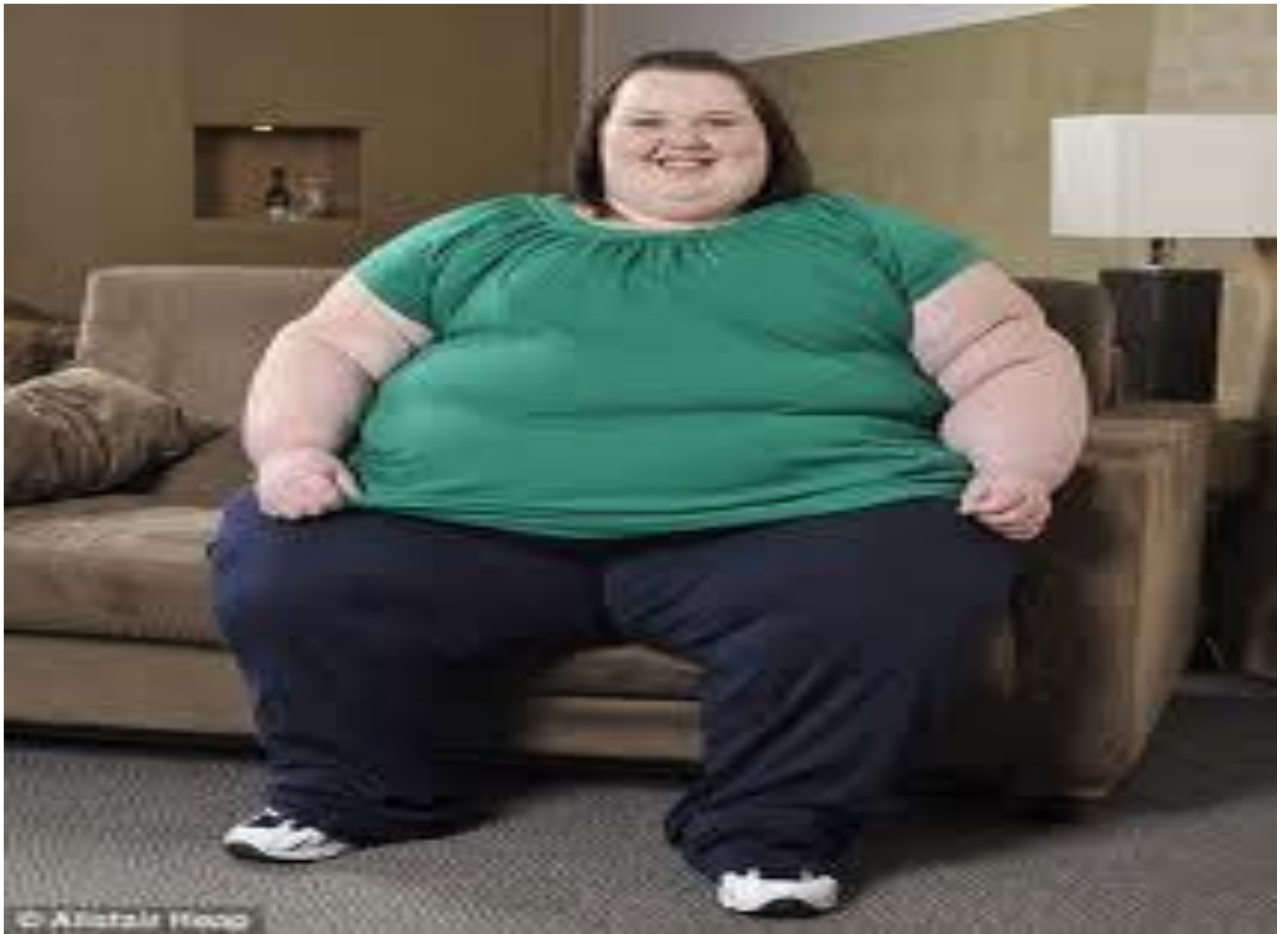
OBESITY

- Having too much body **fat**
- Accumulation of **fat cells** in adipose tissues
- Body weight comprises of **water, fat, muscle** and **bone**

(WHO, 2008)







ASSESSMENT OF OBESITY FOR ASIAN ADULTS

Indicators		Units	Female	Male
Body Fat		%	≥ 31	≥ 25
BMI	Overweight	Kg/m ²	23.0 - 24.9	
	Obese		≥ 25	
Waist Circumference		cm	≥ 80	≥ 90
		inches	≥ 31.5	≥ 35.5

(WHO, 2012)

HUMAN BODY COMPOSITION (ADULTS)

Components (%)	Female	Male
Body Fat	21 - 24	14 - 17
Body Water	55 - 60	60 - 65
Body Muscle Mass	35 - 39	43 - 56
Body Bone Mass	12	14

(Body Composition Manual, BG-64, Germany)

MINIMUM DRINKING WATER REQUIREMENTS (ADULTS)

Status	Liter/Day
Male	2.9
Female	2.2
Pregnancy	4.5
Lactation	4.8
Laborer	5.5

(WHO, 2004)

ACID-ALKALINE BALANCE

Status	Blood pH
Acid-Alkaline Balance	7.35 - 7.45
Acid-Alkaline Imbalance	< 7.35 or > 7.45
Acidosis	≤ 7.30
Alkalosis	≥ 7.50
Coma, Convulsions, Death	< 6.95 or > 7.70

(Chatterjea and Shinde, 2004)

OBJECTIVES

- **To assess of NHS of university girls with reference to their body fat (%)**

RESEARCH METHODOLOGY

Ethical Review of Research Project

- Approved by Departmental Review Committee for Ethics (**DRCE**), Institute of Food Science and Nutrition, University of Sargodha

(Gibney, 2009)

Inclusion Criteria

- University girls aged **16-20** years

(WHO, 1992)

RESEARCH METHODOLOGY

Variables

- Demographics, socioeconomic status, food intake and eating habits were independent variables; anthropometrics were dependent variables

(Montgomery, 2005)

- Life style pattern and family back ground were confounding variables

(Heppner, 1999)

RESEARCH METHODOLOGY

Delimitations and Limitations

- Target population, study locale and researcher were available (delimitations) while finance and laboratory investigations were constraints (limitations) faced during the research work

(Delva *et al.*, 2002)

Selection Procedure for Volunteers

- University girls were selected for NHS assessment as protocol adopted by

(Mahmood and Butt, 2011)

RESEARCH METHODOLOGY

Study Locale

- **GC Women University** of Faisalabad, was study site
(Fatahalla and Mahmoud, 2004)

Target Population and Sampling Technique

- University girls aged **16-20** years were the target population
- **Random, Convenience** and **Purposive** sampling technique

(Muhammad, 2000)

RESEARCH METHODOLOGY

Permission and Informed Consent

- The **written permission** from authority of GCWUF was taken to conduct the research work
- The **target** population was approached; the research work was explained and discussed in detail
- The information, education and communication (**IEC**) materials were provided to the volunteers
- The **Informed Consent** was taken from girls who want to be part of the research project

(Fatahalla and Mahmoud, 2004)

RESEARCH METHODOLOGY

Sample Size

- **200** university girls were randomly selected from different classes

(Magnani, 1997)

Study Design

- **Cohort** study design was used for the research work

(MacMahon and Trichopoulos, 1996)

RESEARCH METHODOLOGY

Research Instruments

- **Anthropometric** measurements were research instruments for research work

(Kumar *et al.*, 2008)

Data Collection Tools

- Data was collected through tools like questionnaires as **FFQ**

(Rico *et al.*, 2002)

Assessment of Nutritional Health Status

- Following sop was adopted for NHS

RESEARCH METHODOLOGY

Demographics, Anthropometrics and Energetics

- Demographics such as volunteer' name, age, gender, qualification, occupation, income, contact number, family diseases and physical activity level was collected
- Anthropometric measurements of the selected subjects as height, weight, body composition, body mass index, basal metabolic rate and active metabolic rate were recorded (BG-64)

(Jana, 2009)

RESEARCH METHODOLOGY

Assessment of Dietary Intakes

- Dietary intakes of volunteers was assessed by **FFQ** and compared with **Serv. no** given in **Food Guide Pyramid (FGP)**

(Gibson, 1990)

Signs, Symptoms, Medical and Family History

- Clinical signs and symptoms related to **malnutrition** were observed in the volunteers
- **Medical** and **family history** about the **malnutrition** was also explored

(Gibson, 1990)

RESEARCH METHODOLOGY

Vital Signs

- Temperature (°F), BP (mmHg) and Pulse rate (bts/min), Peak Exp. Flow rate (L/min) and Blood O₂ (%) of selected volunteers were recorded

(Gibson, 1990)

Statistical Analysis

- Descriptive statistics was run to check distribution, frequency and significance of data by IBM SPSS-21

(Steel *et al.*, 1997)

RESULTS AND DISCUSSIONS

Alarming

Shocking

Dreadful

???

HEALTH INDICATORS OF UNIVERSITY GIRLS

Indicators	Units	Ref. Val	Means \pm SEM
Age	Years	16 - 20	17.42 \pm 4.36
Height	Inches	64	60.37 \pm 6.32
Weight	Kg	54	57.09 \pm 7.18
AMR	K. cal	2160	1691.24 \pm 52.5
BMI	Kg/m ²	18.0 - 22.9	24.18 \pm 4.03
Body Fat	%	17 - 22	27.31 \pm 3.82
Body Water	%	55 - 60	54.30 \pm 7.65
Muscle Mass	%	35 - 41	38.32 \pm 4.63
Bone Mass	Kg	6.48	05.78 \pm 0.79

HEALTH INDICATORS OF UNIVERSITY GIRLS

Indicators	Units	Ref. Val	Means \pm SEM
Drinking Water Intake	L /d	3.4	1.12 \pm 0.36
Physical Activity	60 min/d	Running	Sedentary
Peak Exp. Flow Rate	L /min	413	282 \pm 20.5
Blood Pressure	mmHg	115 / 72	123.49 / 85.25
Temperature	$^{\circ}$ F	98.6	97.61 \pm 2.83
Pulse Rate	Bts/min	72 - 80	107.5 \pm 4.78
Blood O ₂ Saturation	%	\geq 96	95.24 \pm 2.62

HEALTH INDICATORS OF UNIVERSITY GIRLS

Food Groups	Units	Ref. Val	Means \pm SEM
Junk / Fast / Snacks	Serv no	0	6.2 \pm 2.67
Fats, Oils & Sweets	Serv no	Sparing	1.7 \pm 0.56
Meat, Poultry, Fish, Dry Beans, Eggs & Nuts	Serv no	2 - 3	1.5 \pm 0.45
Milk, Yoghurt & Cheese	Serv no	2 - 3	0.9 \pm 0.23
Fruits	Serv no	2 - 4	1.3 \pm 0.14
Vegetables	Serv no	3 - 5	2.48 \pm 0.39
Bread, Cereal, Rice & Pasta	Serv no	6 -11	7.25 \pm 2.61

PREVALENCE OF OBESITY AND UNDER WEIGHT IN UNIVERSITY GIRLS

Indicators	Units	Ref. Val	Obese (29%)	Under Weight (43%)
			Means± SEM	Means± SEM
Weight	Kg	54	70.53 ± 7.53	47.03 ± 1.22
Body Fat	%	17 - 22	40.03 ± 2.80	28.32 ± 4.21
Body Water	%	55 - 60	42.34 ± 7.51	52.05 ± 4.23
Blood O ₂	%	≥ 96	82.22 ± 5.96	90.80 ± 2.24

CONCLUSIONS

University Girls (16-20 years)

- Becoming **short statured**
- Getting **fat (obese)**
- Consuming **less calories (calories dense foods)**
- Having **very poor water intake, PA & Respiration**
- Depicting **Worst Vital Signs**
- **Unhealthy Dietary Intakes**
- **Majority was Malnourished**

RECOMMENDATIONS

- **Large scale studies** should be carried out
- **Indicative Biomarkers** should be investigated
- **Research funds** should be provided

CAUSES OF MALNUTRITION

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COMBAT THE OBESITY

Nutrition?

Nutrition ??

Nutrition ???







FOOD FOR BRAIN

?

?





RESEARCH DESIGN

Cross-Sectional Study

- Observational study that involves analysis of data collected from target population at one specific point in time
- Aim to provide data on the entire population under study
- Descriptive study that describe some feature of the population, such as prevalence of an illness, or they may support inferences of cause and effect

(Schmidt and Kohlmann, 2008)

FOOD AND HEALTH

- **FUNCTIONAL FOODS**

Provision of healthful components beyond basic nutrient

- **NUTRACEUTICALS**

purified/extracted healthful components

- **FOOD SUPPLEMENTS**

Added healthful components

LET FOOD BE THY MEDICINE

BIOACTIVE COMPOUNDS

The components of food that have a significant role in physiology of body

DIET PLANNING

The process to select a food as diet to maintain health

DIET THERAPY

The process to select a food as diet to restore health