**BCH 208 LECTURE NOTES ON ASSESSMENT OF NUTRITIONAL STATUS AS COMPILED**

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**ASSESSMENT OF NUTRITIONAL STATUS**

* Nutritional status is the health status that is produced by balance between requirements and intake.
* Nutritional assessment is the measurement of nutritional status by anthropometric, biochemical, clinical, dietary history etc.
* The nutritional status of an individual is often the result of many inter-related factors.
* It is influenced by food intake, quantity and quality including physical health.
* The spectrum of nutritional status spreads from obesity to severe malnutrition.

**PURPOSE OF NUTRITIONAL ASSESSMENT**

1. To identify individuals or population groups at risk of becoming malnourished.
2. To identify individuals or population groups who are malnourished.
3. To develop health care programs that meet the community needs, which are defined by the assessment.
4. To measure the effectiveness of the nutritional programs and intervention once initiated.

**METHODS OF NUTRITIONAL ASSESSMENT**

Nutrition is assessed by two types of methods.

1. Direct method.
2. Indirect method.

**DIRECT METHODS**

Direct methods deal with the individual and measure objective criteria.

**INDIRECT METHODS**

Indirect methods use community health indices that reflect nutritional influences.

**DIRECT METHODS OF NUTRITIONAL ASSESSMENT**

These are summarized as **ABCD**

1. Anthropometric methods
2. Biochemical methods
3. Clinical methods
4. Dietary evaluation methods.

**INDIRECT METHODS OF NUTRITIONAL ASSESSMENT**

These include three categories:

1. Ecological variables including crop production
2. Economic factors e.g. per capita income, population density and social habits.
3. Vital health statistics particularly infant and under five mortality and fertility index.

**ANTHROPOMETRIC METHODS**

* Anthropometry is the measurement of body height, weight and proportion.
* It is an essential component of clinical examination of infants, children and pregnant women.
* It is used to evaluate both under and over nutrition
* The measured values reflects the current nutritional status and don’t differentiate between acute and chronic changes.

Other anthropometric measurements include:-

* Mid-arm circumference
* Skin fold thickness
* Head circumference
* Head/ chest ratio
* Hip/waist ratio

**ANTROPOMETRY FOR CHILDREN**

* Accurate measurement of height and weight is essential.
* The results can then be used to evaluate the physical growth of the child.
* For growth monitoring, the data are plotted on growth charts over a period of time that is enough to calculate growth velocity, which can then be compared to international standards.

**Nutritional Indices In Adults.**

* The international standard for assessing body size in adults is the body mass index (BMI)
* BMI is compared using the following formula:-

 BMI =Weight (kg)

 Height (m2)

* Evidence shows that high BMI (Obesity level) is associated with type 2 diabetes and high risk of cardiovascular morbidity and mortality.

**Waist /Hip Ratio (WHR)**

* Waist circumference is measured at the level of the umbilicus to the nearest 0.5cm
* Waist Circumference predicts mortality better than any other anthropometric measurement
* Hip Circumference is measured at the point of greatest circumference around hips and buttocks to the nearest 0.5cm.

**ADVANTAGES OF ANTHROPOMETRY**

1. Objective with high specificity and sensitivity.
2. Measures many variables of nutritional significance (Ht, Wt, MAC, and HC, Skin fold thickness, Waist & Hip ratio & BMI).
3. Readings are numerical and gradable on standard growth charts.
4. Readings are reproducible
5. Non-exposure and need minimal training.

**LIMITATIONS OF ANTHROPOMETRY**

1. Inter-observer errors in measurement
2. Limited nutritional diagnosis
3. Problems with reference standards, i.e. local versus international standards
4. Arbitrary statistical cut-off levels for what is considered as abnormal values.

**BIOCHEMICAL / LABORATORY ASSESSMENT**

* Hemoglobin estimation is a very useful index of the overall state of nutrition. Beside anemia, it also tells overall state of nutrition. Beside anemia, it also tells about protein and trace element nutrition.
* Stool examination for the presence of ova and /or intestinal parasites.
* Urine dipstick and microscopy for albumin, sugar and blood.

**Specific Laboratory Tests**

1. Measurement of individual nutrient in body fluid (e.g. serum, retinol, serum iron, urinary iodine, Vit D).
2. Detection of abnormal amount of metabolites in the urine (e.g. urinary creatinine/ hydroxyproline ratio).
3. Analysis of hair nails and skin for micro-nutrients.

**ADVANTAGES OF BIOCHEMICAL METHODS**

1. It is useful in detecting early changes in body metabolism and nutrition before the appearance of overt clinical signs.
2. It is precise, accurate and reproducible.
3. It is useful to validate data obtained from dietary methods e.g. comparing salt intake with 24-hour urinary excretion.

**Limitations of Biochemical Method**

1. Time consuming
2. Expensive
3. They cannot be applied on large scale
4. Needs trained personnel and facilities

**CLINICAL ASSESSMENT**

* It is an essential feature of all nutritional surveys.
* It is the simplest and most practical method of ascertaining the nutritional status of a group of individuals.
* It utilizes a number of physical signs (specific and non specific) that are known to be associated with malnutrition and deficiency of vitamin and micronutrients.
* Good nutritional history should be obtained
* General clinical examination with special attention to organs like hair, angles of the mouth, gums, nails, skin, eyes, tongues, muscles, bones and thyroid gland.
* Detection of relevant signs helps in establishing the nutritional diagnosis.

**ADVANTAGES OF CLINICAL ASSESSMENT**

1. Fast and easy to perform
2. Inexpensive
3. Non-invasive

**LIMITATIONS**

1. Do not detect early cases.

**DIETARY ASSESSMENT**

* Nutritional intake of humans is assessed by five different methods
1. 24 hour dietary recall
2. Food frequency questionnaire
3. Dietary history since early life.
4. Food dietary technique
5. Observed food consumption.