

CHAPTER 11:

CONDUCT NUTRITION CARE PROCESS

11.1 Introduction of the Unit of Learning / Unit of Competency

This unit specifies the competencies required to examine client nutrition status. It includes carrying out nutrition assessment, conduct nutrition diagnosis, conduct nutrition interventions, and conduct nutrition monitoring and conducting nutrition evaluation.

11.2 Performance Standard

By the end of this learning unit/competency, the trainee should be able to apply the nutrition care process based on the expectations and priorities of individuals group and population; carry out nutrition assessment as per resource materials, user needs, policies and guidelines; develop a nutrition diagnosis in collaboration with other health workers based on the results of nutrition assessment and resource material; conduct prescriptions for nutrition interventions as per WHO/MOH policies and guidelines; conduct evaluation of the entire care process based on the intervention plan and WHO policies and guidelines; and, audit the entire nutrition care process based on resource materials and policies and guidelines.

11.3 Learning Outcomes

11.3.1 List of the Learning Outcomes

1. Carry out nutrition assessment
2. Conduct nutrition diagnosis
3. Conduct prescriptions for nutrition interventions
4. Conduct monitoring and dietary assessment
5. Conduct evaluation for the entire nutrition care process.

11.3.2 Learning Outcome 1: Carry out nutrition assessment

11.3.2.1 Learning Activities

Learning activity	Special instruction
i) Determine anthropometric methods and tools	<ul style="list-style-type: none"> ➤ Collect and document data on dietary intake using relevant tools as per organizational procedure ➤ Examine eating patterns e.g. number of meals, kind, amount, where is eaten, religious and cultural restriction, ability to feed self.
ii) Identify, interpret and evaluate biochemical assessments	<ul style="list-style-type: none"> ➤ Identify the data that would lead into a possible nutritional diagnosis ➤ Collect clinical evidence of a nutrient deficiency ➤ Recommend further testing if a nutrition problem is not identified
iii) Identify and determine clinical and physical assessments <ul style="list-style-type: none"> • Review doctor's/paramedical worker's notes 	<ul style="list-style-type: none"> ➤ Organize and cluster assessment data to identify a nutrition diagnosis ➤ Review data collected for factors that affect nutritional and health status ➤ Avoid working in isolation and collaborate with the medical team
iv) Conduct dietary assessment	<ul style="list-style-type: none"> ➤ Collect and document data on dietary intake using relevant tools as per organizational procedure ➤ Collect clinical evidence of a nutrient deficiency ➤ Identify the data that would lead into a possible nutritional diagnosis ➤ Review the clustered data against the standards to identify similar signs or symptoms ➤ Recommend further testing if a nutrition problem is not identified
v) Conduct socio-economic evaluation	<ul style="list-style-type: none"> ➤ Examine eating patterns e.g. number of meals, kind, amount, where is eaten, religious and cultural restriction ➤ Obtain history from guardians, for persons who cannot express themselves well such as young children, elderly or mentally challenged ➤ Obtain patients history through face to face interviews, reading patients file, referral notes. ➤ Use the patient's file determine patient's history and profile

vi) Perform functionality assessment	<ul style="list-style-type: none"> ➤ Identify the patient/client ➤ Create a conducive environment ➤ Establish a rapport with the client ➤ View work place procedure manual ➤ Conduct tests or procedures to aid in evaluation ➤ Review the client's ability to feed self ➤ Perform handgrip assessment ➤ Perform exercise tolerance ➤ Support patient on nutritional needs
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11.3.2.2 Information Sheet

Definitions

- o **Undernutrition:** condition that results when insufficient food is consumed over an extended period of time
- o **Overnutrition:** pathological state resulting from the consumption of excessive quantity of food over an extended time
- o **Dietary data:** information related to food and dietary supplements intake that will allow for accurate and reliable nutrient intake estimation
- o **Data sources:** Organized assessment data that is clustered for comparison with defining characteristics of suspected diagnoses as listed in diagnosis reference sheets.
- o **Demographic status of patient:** refers to Socioeconomic characteristics of a population expressed statistically, such as age, sex, education level, income level, marital status, occupation, religion, birth rate, death rate, average size of a family, average age at marriage. For example a census is a collection of the demographic factors associated with every member of a population.
- o **Patient socioeconomic status:** Socioeconomic status is the social standing or class of an individual or group. It is often measured as a combination of education, income and occupation
- o **Functional assessment:** these are tests are used to assess the degree of alteration in physiological functions which could lead to impaired nutritional status
- o **Hand-grip strength:** the measure of the maximum static force that a hand can squeeze using a dynamometer
- o **Exercise tolerance:** refers to the exercise capacity of a client as measured by their ability to endure exercise as well as the maximum workload achieved during the exercise period
- o **Ambulation:** is defined as moving a patient from one place to another

Nutrition assessment

A nutritionist/dietician as a health practitioner should use different methods of nutritional assessment to assess the nutritional status of children, mothers and other adults.

Nutritional assessment is the interpretation of anthropometric, biochemical (laboratory), clinical and dietary data to determine whether a person or groups of people are well nourished or malnourished (over-nourished or under-nourished). Nutrition assessment is discussed in details in chapter 25 (Nutrition assessment and surveillance) of this learning guide.

Categories of Nutrition Assessment Data

How do nutrition/dietetics professionals determine where to obtain nutrition assessment data?

1. Anthropometric measurements
 - Include height/length, weight, body mass index (BMI), mid upper arm circumference, skin fold thickness growth rate, and rate of weight change. In young children, head circumference and chest circumference are also measured to assess patterns of growth and development and deviation from average size
2. Food and Nutrition related history
 - Food intake, nutrition and health awareness and management, physical activity and exercise, and food availability
3. Biochemical data, medical tests and procedures
 - Include laboratory data (e.g., electrolytes, glucose, lipid panel, and gastric emptying time).
 - Laboratory investigations to be done to exclude the underlying cause including routine examination of stool, urine, blood and x- rays.
 - Estimation of HB, serum proteins, enzymes, blood level of nutrients like vitamins, iron, amino acid, etc. to be done whenever indicated.
 - Assessment of associated problems like tuberculosis, mal-absorption syndrome, any infection or infestations should be made to find out the probable cause of nutritional deficiency.
4. Nutrition-focused physical findings
 - Include oral health, general physical appearance, muscle and subcutaneous fat wasting
 - Clinical examination of the client is done to assess deficiency signs and associated problems.
5. Client history
 - Include medication and supplement history, social history, medical/health history, and personal history.

Nutrition care indicators

Clearly defined markers – measureable

- Food and nutrient intake
- Medication use
- Growth and body composition
- Food and nutrition related knowledge
- Attitudes and behaviors
- Food access
- Physical activity
- Anthropometric data
- Laboratory values
- Physical findings (observed or reported)
- Personal and family medical history, social factors

Types of data to collect

- i) Nutritional adequacy
- ii) Health status (physical and clinical conditions, anthropometric and biochemical measurements, physiologic and disease status)
- iii) Eating patterns
- iv) Usual weight
- v) Changes in appetite, taste, smell, chewing, swallowing
- vi) Recent surgery, trauma, burns, infection
- vii) Family history and chronic illness: (e.g. obesity, GI disorder, Diabetes Mellitus, Hypertension(HTN), Cancer)
- viii) Nausea, vomiting, diarrhoea, constipation
- ix) Food allergies or intolerance
- x) Medication and/or supplements
- xi) Self-care behaviours: meal preparation; environment during meal time
- xii) Exercise and activity patterns

Additional history for infants and children

- a) Gestational nutrition: infant birth weight, any delay in physical or mental growth
- b) Infant breastfed or bottle fed
- c) Child's willingness to eat what is prepared
- d) Overweight and obesity risk factor

Additional history for adolescent

- a) Present weight
- b) What they feel about their Weight
- c) Use of anabolic steroid or other agent to increase muscle size
- d) Overweight and obesity risk factor (amount, time, where, type, skipped meals..)
- e) Age first started menstruating (for girls).

Additional history for pregnant women

- a) Number of pregnancies. (how many, problems, vitamins or supplements taken)
- b) Food preferences when pregnant. (preferred, avoid, crave any particular foods)

Additional history for geriatrics

- a) Any diet differences from when you were in your 40s and 50s? (why, what factor affect: note physiologic or psychological changes or socioeconomic changes)

Components of nutrition assessment process

- Review data collected for factors that affect nutritional and health status
- Cluster individual data elements to identify a nutrition diagnosis as described in the nutrition diagnosis reference sheets
- Identify standards for data comparison

Data sources

The client's assessment data can be obtained from the following sources;

- i) Screening or referral form
- ii) Patient/client interview
- iii) Medical or health records
- iv) Observation and measurements
- v) Consultation with caregivers and family
- vi) Community based surveys
- vii) Statistical reports
- viii) Administrative data sets
- ix) Epidemiological studies


Nutrition assessment components

- Conducting a dietary intake review for factors that affect health conditions and influence nutrition risk
- Evaluate disease and health condition for nutrition-related consequences
- Evaluation of, functional, psychological and behavioural factors related to food access, selection, preparation, physical activity, and understanding of health condition
- Evaluation of knowledge, potential for changing behaviours, and readiness to learn
- Identifying standards by which data will be compared
- Identifying possible problem areas for making nutrition diagnoses

Functional assessment

Nutrient deficiencies sometimes impair physiological functions

- Tests or procedures may be conducted to aid evaluation
- Examples: skin's response to antigens; hand-grip strength; and exercise tolerance

Functional assessment	Test	Procedure/Content	Expected values	Resources
Handgrip strength index	<p>Handgrip Strength</p> <p>The purpose of this test is to measure the maximum isometric strength of the hand and forearm muscles.</p>	<p>The client should hold the dynamometer in the hand to be tested, with the arm at right angles and the elbow by the side of the body. The handle of the dynamometer is adjusted if required - the base should rest on the first metacarpal (heel of palm), while the handle should rest on middle of the four fingers. When ready the subject squeezes the dynamometer with maximum isometric effort, which is maintained for about 5 seconds. No other body movement is allowed.</p>	<p>Men= 48 and above</p> <p>Women=26 and above</p>	<p>Video on how a dynamometer works https://www.youtube.com/watch?v=-jmWNKUek3o</p>
Exercise tolerance	<p>Cardiovascular or aerobic exercises, such as walking, jogging, cycling, rowing, dancing, and water aerobics</p>	<p>Metabolic equivalents</p> <p>MET (Metabolic Equivalent Term)</p> <p>1 MET= basal aerobic oxygen consumption to stay alive</p> <p>Exercise intolerance can be objectively quantified using semiquantitative assessments, and surveys and quantitative methods, including timed walking tests (6 minute walk distance) and graded exercise treadmill or bicycle exercise tests.</p>		

		<p>Cardiopulmonary exercise testing on a treadmill or a bicycle ergometer provides the most accurate, reliable, and reproducible assessments of exercise tolerance, and yields multiple important outcomes, including METS, exercise time, exercise workload, blood pressure and heart rate responses, and rate-pressure product.</p>		
Ability to self-feed		<p>The 'Eating-feeding continuum' consists of four major stages: independent eating, assisted eating, assisted feeding and dependent feeding. In the literature 'independent eating' and 'self-feeding' are terms that are loosely defined and often used indiscriminately to include truly independent eating and assisted independent eating. A patient can remain independent and self-feed even if he or she cannot cook, shop or clear away. A good example of this would be the individual who needs a Meals-on- Wheels service.</p> <p>Independent eating skills can be defined as a series of independent activities which include:</p> <ul style="list-style-type: none"> - The desire for food and fluid - The ability to recognize food - The motivation to seek out, select and bring home food 		
		<ul style="list-style-type: none"> - The ability to prepare food and drinks by cutting, chopping, mixing, cooking and serving a meal or snack <p>Useful eating aids should include padded cutlery, two-handled beakers, uni-valvular straws, rubber placemats, eggcups with a suction base, plate guards and tilting teapots.</p>		

Ambulation		Once a patient is assessed as safe to ambulate, determine if assistance from additional health care providers or assistive devices is required		Vedio on assessment for ambulation https://www.youtube.com/watch?v=X_qucAc9hmo Vedio on Gait cycle and gait analysis https://www.youtube.com/watch?v=1u6d1CX7o9c
Wheel chair bound		If dealing with a disability that reduces the mobility, nutrition plays a vital role in keeping the client healthy. Proper nutrition will help the client to avoid pressure sores, type 2 diabetes and urinary tract infections. Ensure the client is having sufficient and nutritious meals daily.		

Clinically significant metabolic Equivalents for Maximum Exercise

1 MET:	Resting
2 METS	Level walking at 2mph
4 METs	Level walking at 2mph
<5 METs	Poor prognosis; peak cost of basic activities of daily living
10 METs	Prognosis with medical therapy as good as coronary bypass surgery; unlikely to exhibit significant nuclear perfusion defect
13 METs	Excellent prognosis regardless of other exercise responses
18 METs	Elite endurance athletes
20 METs	World class athletes

Categories of cut-offs of physical activity e.g. sedentary, light activity, moderate activity, high activity and highly active.

	Relative intensity		Absolute intensity (METs) in different age groups ^a			
	$V_{O_2 \max}$ (%)	HR _{max} (%)	Young (20–39 years)	Middle-aged (40–64 years)	Old (65–79 years)	Very old (>80 years)
Light	25–44	30–49	3.0–4.7	2.5–4.4	2.0–3.5	1.26–2.2
Moderate	45–59	50–69	4.8–7.1	4.5–5.9	3.6–4.7	2.3–2.95
Hard	60–84	70–89	7.2–10.1	6.0–8.4	4.8–6.7	3.0–4.25
Very hard	≥85	≥90	≥10.2	≥8.5	≥6.8	≥4.25
Maximum ^b	100	100	12.0	10.0	8.0	5

Adapted from: Physical Activity and Health: A Report from the Surgeon General (1996).

^a Absolute intensity values are approximate mean values for healthy men and usually 1–2 metabolic energy turnover units (METs) lower in women.

^b Maximum values are approximate values achieved during maximum exercise.

$V_{O_2 \max}$: maximum oxygen uptake; HR_{max}: maximum heart rate.

Establishing patient's Demographic and socio economic status;

Patient assessment is perhaps the most practical method of obtaining an overview of the nutritional status of a given patient. Poverty, housing, health, disease, cultural and ethnic differences, food supply, and community health programs, to name a few major factors, affect the patient's nutritional levels. Gathering existing data on these and other factors will help determine whether the patient's nutritional resources are adequate, what groups are potentially at high nutritional risk, and how well the patient's nutritional and related health needs are being met by? Existing curative and preventive health programs.

In effect, a patient's demographic and socio economic assessment paints a picture of the his general health and the factors influencing the way the patient live. To do this, demographic, epidemiologic, cultural and geographic data must all be utilized by the nutritionist. The patient's entire health-care capabilities-including medical, educational, and social welfare as well as nutritional-must be surveyed.

Patient's assessment relies primarily on existing sources of information. These may include vital statistics, hospital records and patient's own history.

Histories taken during assessment

1. Medical history

Medical history provides much insight into nutrition-related problems.

The client should be assessed on the following;

- Main complaint
- Present and past illnesses
- Current health status
- Gastrointestinal problems like abdominal pain/cramping, diarrhea, nausea & vomiting
- Bowel movement patterns

- Increased metabolic needs
- Increased nutritional losses
- Allergies
- Presence of opportunistic infections
- Past or present surgeries
- Alcohol and drug use
- Family history of disease and concurrent medical problems/chronic diseases (e.g. hypertension, diabetes, cancer, malaria)
- Examination for physical conditions
- Recent significant weight loss

The medical profile of the client should also be examined with regards to the medications taken and their side effects. The negative effects of food intake or malabsorption of nutrients should be addressed appropriately.

2. Social history

Social aspects of the medical history may also influence nutrition status (e.g., information relating to socioeconomic status, the individual's ability to buy food independently, whether the person is living or eating alone, physical or mental handicaps, smoking, or drug or alcohol addiction. In older adults, confusion caused by environmental changes, unsuitable housing conditions, lack of socialization at meals, psychological problems, or poverty may add to the risks. In order to meet the needs of diverse groups of clients, knowledge of various cultures is critical during the interviewing process. Factors that affect a person's cultural values include;

- | | |
|---------------------|--|
| - religious beliefs | - education |
| - rituals | - communication style |
| - symbols | - views on health, wellness, and illness |
| - language | - racial identity |
| - dietary practices | |

Rapport establishment with clients of different cultures is important for positive outcomes.

3. Medication history

Gathering of medication history is a very important part of nutrition assessment because food/nutrients and drugs interact in many ways that may affect nutrition status and drug therapy effectiveness. The geriatrics, the chronically ill, those who have a history of inadequate nutritional intake, or are receiving multiple drugs for a period are prone to drug-induced nutritional deficiencies. The effectiveness of drug therapy can also be altered by specific

foods and the timing of food and meal consumption. Use of herbal products may also affect the effects of medications.

4. Nutrition/Diet history

During nutrition/diet history assessment, the problems need to be evaluated include; anorexia, loss of the sense of taste (ageusia), diminished or distorted taste (dysgeusia), of smell (anosmia loss), excessive alcohol intake, poor-fitting dentures, food faddism, mastication or swallowing problems, frequent meals away from home, adverse food and drug interactions, dietary cultural or religious restrictions, an inability to eat for more than 7 to 10 days, intravenous fluid therapy for more than 5 days, or feeding dependence can lead to inadequate nutrient intake and nutritional inadequacy.

Alternative nutrition therapies, including use of mega doses of vitamins and minerals, various herbs, macrobiotic diets, probiotics, and amino acid supplements, must be addressed because they have an effect on the individual's nutritional and overall health care

Output of nutrition assessment

Results of nutrition assessment;

- Lead to appropriate initial determination that a nutrition diagnosis/problem exists
- If a nutrition diagnosis can be made, the Nutritionist labels the problem and creates a PES (Problem, Etiology, Signs/Symptoms) statement in Step 2 of the Nutrition Care Process
- If a nutrition problem is not identified, further information or testing may be necessary to make a determination
- If the assessment indicates that no nutrition problem currently exists that warrants a nutrition intervention, the term "No nutrition diagnosis at this time (NO-1.1)" may be documented

Critical thinking during assessment

When determining medical condition, it is very critical to;

- Determine appropriate data to collect
- Observe for verbal and non-verbal cues that can guide and prompt affective interviewing methods
- Determine the need for additional information
- Select assessment tools and procedures that match the situation
- Apply assessment tools in valid and reliable ways
- Distinguish relevant from irrelevant data
- Distinguish important from unimportant data
- Validate the data

- Organize and categorize the validated data in a meaningful framework that relates to nutrition related problems

Documentation of assessment data

Documentation is an ongoing process that is expected to support the four (4) steps in the Nutrition Care Process. For the documentation of the assessment to meet the quality standards, it should have relevance, accuracy, and timeliness.

Other information that would further describe quality assessment documentation include:

- Date and time of assessment
- Relevant data collected and comparison with reference standards
- Subject's perceptions, values, and motivation related to presenting problems
- Changes in subject's level of understanding, food-related behaviours, and other clinical outcomes for appropriate follow-up
- Reason for discharge/discontinuation if appropriate

Case study

Arianna was a healthy 16-year-old girl who was so happy to return to school this year. This is her junior year of high school, and she has been looking forward to attending the junior senior prom with Mike. Arianna is very active in cheerleading, Photo Club, gymnastics, and swimming. She has decided to join the Prom Committee this year so she can help plan the best prom that Wayne High has ever seen. Arianna has begun to look for prom dresses knowing that she will need to be saving every cent she can to afford the most perfect dress. Arianna has decided that she would like to lose a few extra pounds before the prom and decides to go on a strict diet. Arianna's friends have noticed that the once perky, playful superstar of the swimming team has been losing her "shine." She has dull, limp hair, which is a total change from the full head of shiny, bouncy black hair. Arianna has developed a complexion problem and has started using all kinds of acne products. Her skin is very oily and feels dirty all the time. Arianna's friends also noticed that she is not as pleasant as before, and Arianna has started to lose lots of her friends. Arianna's friend Ruth contacted Arianna's mother and told her of her concerns. Arianna's mother agreed that she had also noticed the changes and would take Arianna to the doctor.

- a. Identify three changes in Arianna to suggest that she was getting into trouble.
- b. What information would be important to share with the physician?
- c. In which category of nutritional assessment would you list Arianna's observations?
- d. Which observation would you consider significant enough to cause concern?

11.3.2.3 Self-Assessment

1. Define the following terms;
 - A. Data sources
 - B. Overnutrition
 - C. Differential diagnosis
 - D. Ambulation
2. Dietary data is _____
 - A. Organized assessment data that is clustered for comparison with defining characteristics of suspected diagnoses.
 - B. Investigation or analysis of the cause or nature of a condition, situation or problem.
 - C. information related to food and dietary supplements intake that will allow for accurate and reliable nutrient intake estimation
 - D. Pre-defined criteria (signs and symptoms) to which the current situation can be compared.
3. Screening forms, community based surveys, epidemiological studies and statistical reports are all classified under;
 - A. Medical history
 - B. Social history
 - C. Nutrition care indicators
 - D. Data sources
4. Client history include all of the following (indicate true/false against each answer)
 - a. Supplement history
 - b. Medical history
 - c. Health history
 - d. None of the above
5. Identify the components of the nutrition diagnosis reference sheets
6. Describe the rapid screening methods and tools used to determine underlying medical condition
7. Explain the laboratory methods used to determine deficiencies
8. State the data sources used in determining underlying medical condition
9. Describe the stages of Feeding eating continuum assessment
10. Independent eating skills can be defined as a series of independent activities. Explain these activities
11. Explain how you will meet the nutritional needs of a patient who is wheel chair bound and cannot self-feed

11.3.2.4 Equipment and Materials

<p>Microtoise</p> 	<p>Stadiometers</p> 	<p>Calipers</p> 
<p>Dynamometer</p> 	<p>Height Boards</p> 	<p>Weighing scales/Beam balance</p> 
<p>Adult MUAC tapes</p> 	<p>Color-coded measuring tapes</p> 	<p>Salter scale</p> 
<p>Children MUAC tapes</p> 	<p>Length boards</p> 	

Materials and resources

1. Computers with internet
2. Library and resource Centre
3. WHO guidelines
4. MOH policies and guidelines
5. Skills lab
6. LCDs, video clips, charts and other teaching aids
7. Invitation of competent expertise

11.3.2.5 References

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11.3.3 Learning Outcome 2: Conduct nutrition diagnosis

11.3.3.1 Learning Activities

Learning activity	Special instruction
<p>i) Determine underlying medical condition of the client</p> <ul style="list-style-type: none"> • Carry out diagnostic procedures • Carry out differential diagnosis 	<ul style="list-style-type: none"> ➤ Carry out rapid screening methods like MUAC and BMI ➤ Conduct diagnostic/biochemical examinations ➤ Organize and cluster assessment data to identify a nutrition diagnosis ➤ Review data collected for factors that affect nutritional and health status ➤ Collaborate with the medical team
<p>ii) Label and classify nutrition problems of client</p> <ul style="list-style-type: none"> • Identify standards for data comparison 	<ul style="list-style-type: none"> ➤ Review the clustered data against the standards to identify similar signs or symptoms ➤ Classify the nutrition problems into the various domains <ul style="list-style-type: none"> ○ Intake domain ○ Clinical domain ○ Behavioral-environmental domain
<p>iii) Identify and describe etiology of conditions</p> <ul style="list-style-type: none"> • Examine client intrinsic factors • Examine client extrinsic factors are assessed • Determine client Iatrogenic causes • Consider doctor's prescription 	<ul style="list-style-type: none"> ➤ Observe clues of possible inadequate intake compared to the established reference standards ➤ Classify the causes of the various nutrition problems ➤ Document any medical disease(s)/condition(s) that the client may be having as per the medical notes ➤ Document the family history of the patient as pertaining the current health status
<p>iv) Identify and describe signs and symptoms</p> <ul style="list-style-type: none"> • Check signs and symptoms • Consider the doctor's prescription 	<ul style="list-style-type: none"> ➤ Review medical diagnosis ➤ Identify and document the defining characteristics that the nutritionist/dietitian can treat independently based on the intake domain

<p>v) Determine nutrition diagnosis</p> <ul style="list-style-type: none"> • Consider the results of anthropometric measurements, biochemical, clinical signs and symptoms, dietary, socio-economic and functional assessments. 	<ul style="list-style-type: none"> ➤ Cluster the nutrition problems, causes and defining characteristics ➤ Develop nutrition diagnosis statement (PES statement) ➤ Document nutritional diagnosis as per work place procedures
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11.3.3.2 Information Sheet

Definitions

- **Nutrition problem:** “actual problems related to intake of energy, nutrients, fluids, bioactive substances through oral diet or nutrition support (enteral or parenteral nutrition)
- **Nutrient:** components of food that help to nourish the body e.g. carbohydrates, proteins, vitamins, lipids (fats), minerals and water
- **Imbalance:** pathological state resulting from disproportion among essential nutrients with or without the absolute deficiency of any nutrient
- **Specific deficiency:** pathological state resulting from relative or absolute lack of specific nutrients
- **Diagnosis:** the act of identifying a disease or condition from its signs and symptoms
- **Differential diagnosis:** the process of weighing the probability of one disease versus that of other diseases possibly accounting for a patient’s illness by considering shared signs and symptoms.
- **Diagnostic procedure:** is an examination to identify a client’s specific signs and symptoms in order determine a condition, disease or illness.
- **Etiology:** factors that contribute to the cause or existence of a particular problem
- **Client intrinsic factors:** factors that originate from within the client which may cause a nutritional problem
- **Client extrinsic factors:** factors that originate outside of the client and their control
- **Drug-nutrient interaction:** an alteration of kinetics or dynamics of a drug or a nutritional element, or a compromise in nutritional status as a result of the addition of a drug
- **Signs:** are observable changes (objective data) in the patient/client or groups health status
- **Symptoms:** changes that the patient/client/group feels and expresses verbally (subjective data) to the dietitians professional

- **Nutrition diagnosis:** a food and nutrition professional's identification and labelling of an existing nutrition problem that the food and nutrition professional is responsible for treating independently.
 - o It also refers to the identification and descriptive labeling of an actual occurrence of a nutrition problem that dietetics professionals are responsible for treating independently

Nutrition diagnosis

- It is a new concept for dietetics profession which is the missing link between nutrition assessment and nutrition intervention
- It involves identification and descriptive labeling of an actual occurrence of a nutrition problem that dietetics professionals are responsible for treating independently

Diagnosis involves investigation or analysis of the cause or nature of a condition, situation or problem. A medical diagnosis describes a disease or pathology of organs. Interventions for medical diagnosis may take several forms such as medications, surgery and other therapeutic approaches and may incorporate nutrition intervention.

Diagnosis implies;

- Pre-defined list of conditions
- Pre-defined criteria (signs and symptoms) to which the current situation can be compared.

NUTRITIONAL PROBLEMS

Nutrition problems are alterations in the patient's nutritional status. The problem may already exist, or may be at risk of occurring. This will call for screening tests for malnutrition and other nutrition conditions and interpretation of screening results.

A nutritional deficiency occurs when the body doesn't absorb or get food from the necessary amount of a nutrient. Deficiencies can lead to a variety of health problems. These can include digestion problems, skin disorders, stunted or defective bone growth, and even dementia.

Assessment of dietary intake details the history of dietary patterns, specific food consumed, quality and adequacy in relation of nutrient value.

Types of nutrition problems

There are two main types;

- i) Under nutrition
- ii) Over nutrition

They include the following categories;

- Undernutrition
- Overnutrition
- Specific deficiencies
- imbalances
- Chronic diseases
- Eating disorders

Domains of nutrition problems

Nutritional problems are categorized into three main domains;

- i. Intake Domain – Involves actual problems related to excessive or inadequate intake compared to requirements (actual or estimated).

Diagnostic labels include:

- o Impaired (nutrient utilization...)
- o Altered (GI function...)
- o Inadequate/excessive (calorie intake...)
- o Inappropriate (intake of types of carbohydrate)
- o Swallowing difficulty

It is composed into five (5) categories;

- a) Energy balance
- b) Oral diet or nutrition support intake (EN &PN)
- c) Fluid intake
- d) Bioactive substance
- e) Nutrients

- ii. Clinical Domain –nutrition problems that are related to medical or physical conditions. It includes problems in swallowing, chewing, digestion, absorption, and maintaining appropriate weight. They are medical or physical conditions that are abnormal. It is composed of three categories:

- a) Functional balance: change in physical or mechanical functioning with nutritional consequences
- b) Biochemical balance: change in capacity to metabolize nutrients as a result of medications, surgery, or as indicated by altered lab values
- c) Weight balance: chronic weight or changed weight status when compared with usual or desired body weight

- iii. Behavioral-Environmental Domain – problems that are related to knowledge, attitudes/ beliefs, physical environment or access to food, and food safety. It is composed of three categories;
- a) Knowledge and beliefs
 - b) Physical activity, balance and function
 - c) Food safety and access

To accurately identify a nutritional problem, the question to ask is, “Can the nutritionist/ Dietitian resolve or improve the nutrition diagnosis?” The American Dietitians Academy advises focus on the intake domain as it is more specific to the roles of the nutritionist/ dietician.

Methods of collecting current dietary intake information

24-hour recall: is a guided interview in which an individual recounts all of the foods and beverages consumed in the past 24 hours or during the previous day

Food frequency questionnaire: a survey of food routinely consumed

Food diaries: a detailed log (record of events) of food eaten during a specified time period, usually several days

Direct observation: achieved by observing food intake of the individual directly in a facility

Diagnostic procedures

This include biochemical analysis/Laboratory tests: Laboratory methods are used to determine deficiencies in;

- o Serum protein, particularly albumin level;
- o The blood-forming nutrients: iron, folacin, vitamin B6, and vitamin B12;
- o Water-soluble vitamins: thiamine, riboflavin, niacin, and vitamin C;
- o The fat-soluble vitamins: A, D, E, and K;
- o Minerals: iron, iodine and other trace elements;
- o Levels of blood lipids such as cholesterol and triglycerides, glucose and various enzymes which are implicated in heart disease, diabetes, and other chronic diseases.

Laboratory studies are important because they can detect preclinical nutritional deficiencies and can be used to confirm subjective finding;

- Glucose: plasma glucose level.
 - Normal (60-110 mg/dl), HBA1C

- Haemoglobin: To detect iron deficiency anaemia .(Male:14-18) (Female:12-16)
 - Increase Dehydration.
 - Decrease anaemia.
- Haematocrit : measure cell volume also an indicator of iron status (Male: 37% -49%) (Female :36%to46%)
 - Low value indicate insufficient haemoglobin formation.
- Cholesterol: To evaluate fat metabolism and to assess risk for cardiovascular disease. Normal (120-200), 200 -239 moderate risk, 240 or more high risk.
- Triglycerides: used to screen for hyperlipidaemia and to determine the risk of Coronary artery disease. Normal (< 150mg /dl).
- Serum proteins, Serum albumin: to measure of visceral protein status, Albumin is a better indicator of long-term protein status. Normal (3.5-5.5 g/dl)
 - Low serum albumin level occur with protein calorie malnutrition, altered hydration status, decrease liver function.
- Serum transferrin: Iron transport protein, more sensitive indicator of visceral protein status than albumen.
 - Serum transferrin = (0.8* total iron binding capacity) -43 Normal result (170-250 mg/dl)

Nutrition Diagnosis Reference Sheets

A reference sheet should be available for each nutrition diagnosis. Each reference sheet contains four (4) components;

- a) Problem or Nutrition Diagnosis Label
- b) Definition of the Nutrition Diagnosis Label
- c) Etiology (cause/contributing risk factors)
- d) Signs/Symptoms (defining characteristics)

Etiology

Etiology is a factor gathered during the nutrition assessment that contributes to the existence or the maintenance of pathophysiological, psychosocial, situational, developmental, cultural, and/or environmental problems. Identifying the etiology leads to selection of the nutrition intervention aimed at resolving the underlying cause of the nutrition problem. A nutritionist/dietitian is expected to determine if this is the “root cause” for the problem. If addressing the etiology will not resolve the problem, can the Nutritionist/dietician intervention lessen the signs and symptoms?

Etiologies are grouped by the type of cause or contributing risk factor.

- Beliefs-Attitudes
- Cultural

- Knowledge
- Physical Function
- Physiologic
- Social-Personal
- Treatment

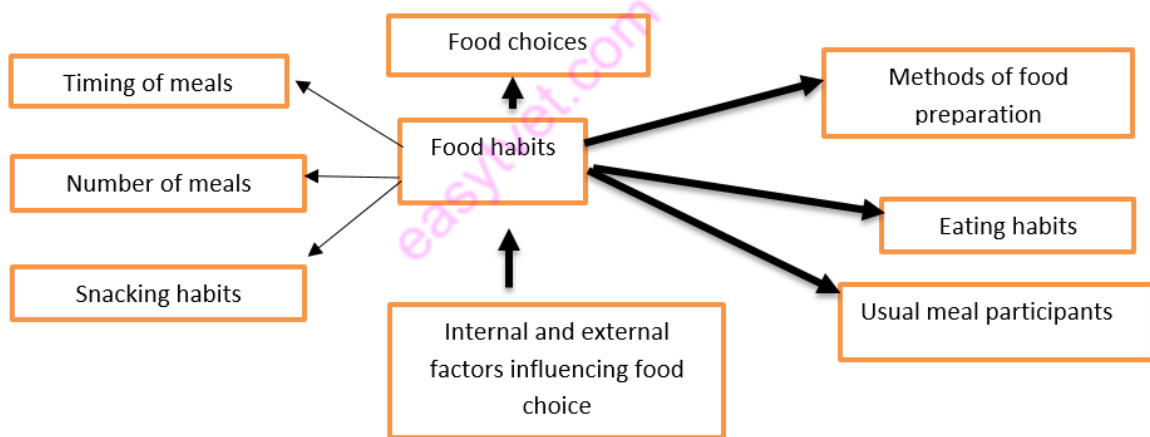
For the following, the category alone may be the cause or contributing risk factor of the nutrition diagnosis

- Access
- Behavior

Internal and external factors influencing food choice

Food habits are seen to provide an important signal of group identity as they influence eating times and number of meal, food preparation methods and meal participants, portion sizes and ways of eating (See Figure below)

Main components of food habits within group



Internal factors determining food choices

The main factors that underpin the drive to eat are physiological and psychological. These are classified as internal biological responses which influence food choice.

Psychological influences may modify or override the physiological need for food e.g. binge eating, or refusal to eat as a result of depression.

Internal factors cannot be separated from the external environment that will have shaped the setting in which these responses have developed e.g. dietary restraint is likely to have developed as a response to a cultural norm for slimness in women; perceptions and preferences for foods may then be shaped by this norm, and become a behavior influencing food choice.

Main physiological and psychological factors believed to have a role in the internal control of food choice

Factor	Expression	Comments
<i>Physiological factors</i>		
Hunger	Need to eat	Often determined by habit
Satiety	Stop food intake by preventing subsequent eating	May be over-ridden if presented with a variety of foods
<i>Psychological factors</i>		
Appetite	Desire for specific foods based on experience	Not thought to be linked to nutritional need
Aversion	Avoidance of specific foods, from (perceived) experience	May severely restrict foods
Preference	Established by frequency of exposure and early learning May also be linked to genetic differences in taste sensitivities	Set specific taste thresholds e.g. to sugar; salt; also resistance to new tastes (neophobia) Reinforced by positive outcomes (e.g. increased alertness)
Emotions (mood and stress)	Specific foods associated with positive and negative emotions	May lead to comfort eating, or food refusal as a weapon
Personality traits	Sensitivity to external and internal cues affecting food intake	May be important in believe about ability to control body weight

Nutritionists/ dieticians should know that recognition of the existence of internal and external factors in food choices is of great importance and that they should allow client's control over their food choice.

If a client losses control of their food choice, their appetite may reduce which may be the problem in institutions where menus are centrally determined. Patients who are prescribed modified diets may also experience a loss of control with consequently poor adherence to the diet.

External factors determining food choices

These factors are determined by the social and cultural context and they also affect both development and persistence of internal factors, as well as food available.

Factor	Description
1) Culture	<ul style="list-style-type: none"> - Defines what is acceptable as food - Confers and reinforces identity and belonging - May identify subgroups for whom certain foods are acceptable - May be overt (staple food, most popular food) or subtle (seasonings used and methods of cooking)
2) Religion	<ul style="list-style-type: none"> - Determines the broad context of food choice (rules) - Prohibitions exists on different types of meat, methods of slaughter, cooking methods and food combinations - Rules may also cover periods of fasting, rituals and festivals
3) Ethical decisions	<ul style="list-style-type: none"> - The way food is produced may affect food choices - Concerns about rearing animals for food and environmentally damaging methods of agriculture - Supporters may alter their food choices to match their ethical principles, choosing organically produced food, becoming vegan or vegetarian
4) Economic factors	<ul style="list-style-type: none"> - Access of food in terms of money or goods for exchange influences food choice - Clients in higher economic class can obtain a greater variety of food - Clients on a low income have limited opportunity to exercise alternative food choices. May be due to poor availability of food in their locality, inadequate money to buy food or both.
5) Social norms	<ul style="list-style-type: none"> - Acceptable behavior within an individuals social circle in relation to food strongly influences food choice - Revolves around peer pressure and reinforces expectations about food - May perpetuate food choices along gender lines, - Social norms may also determine the status of foods whereby some foods are perceived as more prestigious and therefore used to impress others.
6) Education/health awareness	<ul style="list-style-type: none"> - Originates form external environment and determines engagement with food and nutrition issues and the degree to which health issues influence food choice. - Experiences many barriers that interfere with food choices - The recognition of risk from an unhealthy diet, its relevance to the individual and the ability to act on this by food choices are key prerequisites.
7) Media and advertising	<ul style="list-style-type: none"> - Provide information about some foods, usually those that have been processed or manufactured and possibly less nutritionally desirable with higher higher levels of fat, salt, and sugar. - Exposure to food advertisements increases awareness and demand for the product.

Social and cultural factors have a great influence on food choice, even when consumers are not conscious of this. These modify or override physiological and psychological factors, and can have both positive and negative consequences on total food intake.

Intrinsic and extrinsic factors impact

Intrinsic factors include nutritional risk factors that influence nutritional status and place an individual at increased risk for poor nutrition. Intrinsic factors include medications, economic status/lacking enough money for food, genetics, age, gender and having an illness or condition (comorbidities) that causes a diet change.

When considered in relation to nutrition, these factors are at least partly responsible for differences between individuals in:

- Absorption of food
- Metabolism
- Enzyme digestion
- Biosynthesis
- Catabolism
- Transport across cell membranes
- Uptake by cell receptors
- Storage
- Excretion

The host-related factors can be further subdivided into intestinal and systemic factors. Reductions in the secretion of hydrochloric acid, gastric acid, and/or intrinsic factor, together with alterations in the permeability of the intestinal mucosa, are all examples of intestinal factors that can markedly influence the absorption of certain nutrients, but that are often ignored when setting dietary requirements. Systemic factors that should also be considered include nutrient status of the host, age, sex, ethnicity, genotype, and physiological state (e.g., pregnancy or lactation), and chronic and acute infectious disease states.

The extrinsic factors are diet-related factors that must be considered depending on the nature of the habitual diet and may include the chemical form of the nutrient and the nature of the dietary matrix, interactions between nutrients and/or organic components, and food preparation and processing practices within the country or region.

Adverse Effects of Nutrient-Drug Interactions

Some drugs may affect the absorption of nutrients, while some foods—for example, those containing caffeine—can amplify or modify the effects of certain drugs. Taking drugs with hot beverages could also make them less effective. Short- or long-term instances of nutrient-drug interactions may be life threatening. A nutrient-drug interaction may also impact the nutritional status of the body. Nutrient-drug interactions can occur with both prescription and over-the-counter medicine.

Impact of Drug-Nutrient Interaction on Nutritional Status

A drug has the capacity of interfering with a person's nutritional status. Appetite may be stimulated by a certain drug, resulting in an increase in nutrient intake due to more food being eaten. However, drugs may also cause a decrease in appetite, leading to a decrease in nutrient intake. In this case, a drug could possibly cause a nutritional deficiency. Nutritional status may also be impacted by a drug's effect on the three main nutrients: carbohydrates, fat, and protein. A drug may speed up or slow down the breakdown of these three nutrients, which are essential to the body's functioning. When a drug affects the absorption of nutrients from food into the body, less energy is available to be used by the body. The impact of the nutrient-drug interaction may vary according to the medicine taken, the dose of the medicine given, and the form taken (e.g., pill, liquid).

Avoiding drug-nutrient interactions

Drug-food interactions which are a potential threat to good nutrition should be avoided at all costs, unless the benefit expected outweighs the potential risk. Ensure the following;

- Take drugs at correct dose and frequency to reduce the severity of the side effects
- Take a gut-irritating drug with or after meals to reduce the chances of discomfort
- Drug administration and meal times may be staggered to avoid unintended interactions
- A drug likely to interact unfavorably with food may be given parenterally
- A drug causing epigastric pain may be given likewise or rectally or as a necessary
- Taking syrup or a liquid drug may prevent prolonged stay of the drug in the gastrointestinal tract hence reducing chances of interaction with food
- If taking phenelzine drug (antidepressant) abstain from eating liver

Signs and symptoms

These are the defining characteristics that serve as evidence that a problem exists

Linked to etiology by words "as evidenced by"

Identifying the etiology will lead to the selection of a nutrition intervention aimed at resolving the underlying cause of the nutrition problem whenever possible. Major and minor etiologies may result from medical, genetic, or environmental factors.

Signs are observable changes (objective data) in the patient/client or groups health status while Symptoms are changes that the patient/client/group feels and expresses verbally (subjective data) to the dietitians professional

Signs and symptoms are grouped by

- o Nutrition assessment category, and
- o Potential indicators of the specific nutrition diagnosis

Assessment of defining characteristics

General appearance: this will provide clues to overall nutritional status e.g. obese, cachetic (fat and muscle wasting), edematous etc. One should review physical assessment findings for signs of poor nutrition

Physical examination

Physical examination can help the assessor detect signs of nutrition deficiency and fluid imbalances.

Clinical signs of malnutrition: signs of malnutrition tends to appear most often in parts of the body where cells replacement occurs at rapid rate such as: eyes, hair, skin, lips, nails and tongue;

Evaluating nutritional disorders

Body system/ Region	Sign or symptom	Implications
General	Weakness and fatigue	Anemia or electrolyte imbalance
	Weight loss	Decreased calorie intake, increased calorie use, or inadequate nutrient intake or absorption
Skin, hair, and nails	<ul style="list-style-type: none"> Dry, flaky skin Dry skin with poor turgor 	<ul style="list-style-type: none"> Vitamin A, vitamin B-complex, or linoleic acid deficiency Dehydration
	Rough, scaly skin with bumps	Vitamin A deficiency
	Petechiae or ecchymoses	Vitamin C or K deficiency
	Sore that won't heal	Protein, vitamin C or zinc deficiency
	Thinning, dry hair	Protein deficiency
	Spoon-shaped, brittle, or ridged nails	Iron deficiency
Eyes	Night blindness; corneal swelling, softening, or dryness; Bitot's spots (gray triangular patches on the conjunctiva)	Vitamin A deficiency
	Red conjunctiva	Riboflavin deficiency
Throat and mouth	Cracks at the corner of the mouth	Riboflavin or niacin deficiency
	Magenta tongue	Riboflavin deficiency
	Beefy red tongue	Vitamin B ₁₂ deficiency
	Soft, spongy, bleeding gums	Vitamin C deficiency
	Poor dentition	Overconsumption of refined sugars or acidic carbonated beverages; illicit drug use

Cardiovascular	Swollen neck (goiter)	Iodine deficiency
	Edema	Protein deficiency, thiamine deficiency
	Third and fourth heart sounds	
	Shortness of breath	
	Cough	Fluid volume deficit; anemia
	Tachycardia, murmur, hypertension	
Gastrointestinal	Ascites	Protein deficiency
Musculoskeletal	Bone pain and bow leg	Vitamin D or calcium deficiency
	Muscle wasting	Protein, carbohydrate, and fat deficiency
Neurologic	Altered mental status	Dehydration and thiamine or vitamin B ₁₂ deficiency
	Ataxia	
	Paresthesia, neuropathies	Vitamin B ₁₂ , pyridoxine, thiamine, or niacin deficiency

Anthropometric measures

These measures evaluate growth, development, and body composition. The most common anthropometric measures include:

- Height or length
- Weight
- Arm and head circumference
- Waist circumference
- Body mass index
- Triceps skin-fold thickness
- Elbow breadth

A. Derived weight measures: (used to depict change in body weight)

- Body weight as a Percent ideal body weight: is the optimal weight recommended for optimal health
Percent ideal body weight = $\frac{\text{current wt.}}{\text{ideal wt.}} \times 100$ (If the result 80% -90% mild malnutrition . 70%- 80% moderate malnutrition . Less than 70% sever malnutrition) .
- Percent usual body weight :
 - o Percent usual body weight = $\frac{\text{current wt.}}{\text{usual wt.}} \times 100$. (If the result 85% -95% mild malnutrition , 75%-84% moderate mal nutrition ,less than 75 % sever malnutrition)
- Recent weight change is calculated by :
 - o Usual wt. – current wt. /usual wt. *100 . (An unintentional loss of >5% of body wt. over 1 month , or > 7.5 % over 3 month , or 10 % over 6 month is clinically significant)

B. BODY MASS INDEX

The body mass index is a practical marker of optimal weight for height and indicator of obesity or under nutrition. It is calculated and interpreted as follows;

$$\text{BMI} = \frac{\text{weight (lb)} * 703}{\text{height}^2 (\text{in}^2)}$$

OR

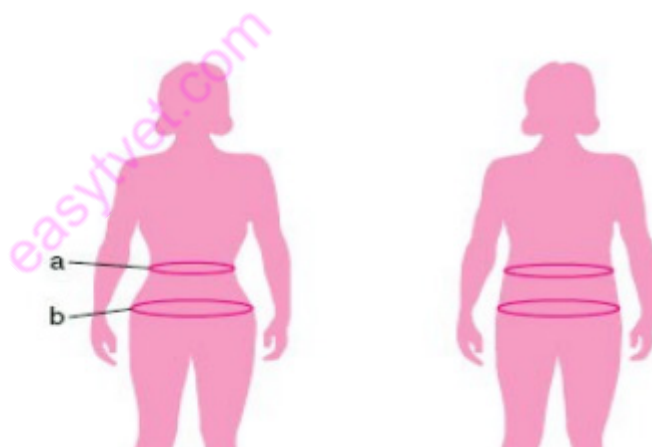
$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height}^2 (\text{m}^2)} \quad (\text{metric})$$

BMI	Weight Status
Below 18.5	Underweight
18.5 - 24.9	Normal
25 - 29.9	Overweight
30 & Above	Obese

C. Waist-Hip ratio

This is used to assess body fat distribution and is calculate as follows;

$$\text{WHR} = \frac{\text{Waist circumference}}{\text{Hip circumference}}$$



Interpretation: 1.0 or more in men the person is obese while if the women is 0.8 or more the women is obese.

D. Skin fold thickness

These measurements provide an estimate of body fat stores or the extent of obesity or under nutrition.(biceps, subcapsular, suprailiac skinfolds).

TSF values 10 % below or above standard suggest under nutrition or over nutrition .

Table 3 - Descriptive and comparative analysis of the anthropometric variables of school-age children of both genders, classified as overweight according to the assessment period (initial, 10 and 20 years)

	Initial	10 years	20 years	Δ%
Male				
Body mass (kg)	32.02±5.62	33.48±7.34	37.14±6.43 [†]	15.99
Height (cm)	130.70±9.35	133.52±10.67	138.45±9.78 [†]	5.92
Biceps (mm)	6.06±1.55	8.54±9.37	9.37±3.04 [†]	54.62
Triceps (mm)	11.94±2.46	13.24±3.75	14.54±5.45	21.77
Subscapular (mm)	6.22±1.10	7.62±2.17	9.90±4.47 [†]	59.16
Suprailiac (mm)	6.30±2.27	9.56±5.75	11.53±5.62 [†]	83.01
Mid-axillary (mm)	5.08±1.52	6.88±3.54	10.00±4.50 [†]	96.85
Abdomen (mm)	8.81±4.16	14.38±8.12	18.10±7.39 [†]	105.44
Calf (mm)	11.92±2.89	14.58±4.84	16.51±6.51 [†]	38.50
X7SF (mm)	8.05±2.03	10.68±4.56	12.83±4.25 [†]	59.37
Female				
Body mass (kg)	35.07±5.73	35.19±5.90	37.48±7.70	6.87
Height (cm)	133.89±8.35	135.07±9.13	137.79±10.97	2.91
Biceps (mm)	9.24±2.79	11.12±2.81	9.93±2.99	7.46
Triceps (mm)	15.98±3.97	17.13±3.21	16.48±3.02	3.12
Subscapular (mm)	10.74±3.87	12.76±3.44	12.75±4.61	18.71
Suprailiac (mm)	11.81±4.72	16.53±4.40 [*]	15.73±5.81 [†]	33.19
Mid-axillary (mm)	9.06±4.47	11.81±3.14	12.42±5.08 [†]	37.08
Abdomen (mm)	15.00±6.24	21.34±4.98 [*]	22.30±5.81 [†]	48.66
Calf (mm)	17.24±3.83	17.43±3.96	17.01±5.42	-1.33
X7DC (mm)	12.72±3.66	15.44±2.87	15.23±3.63 [†]	19.73

Δ% = delta percentage.

X7SF = mean adiposity of the seven SFs (biceps, triceps, subscapular, suprailiac, mid-axillary, abdomen and calf).

p < 0.01.

* Initial different from 10 years.

† Initial different from 20 years.

‡ 10 years different from 20 years.

E. Mid Upper Arm Circumference

MUAC estimates skeletal muscle mass and fat stores.



This method is difficult to obtain and interpret in older adult because of sagging skin, changes in fat distribution, and declining muscle mass.

F. Arm span or total arm length

Measurement arm span is useful those situation in which height is difficult to measure. (children with cerebral palsy, scoliosis or in aging person).



Nutrition Diagnosis and medical diagnosis

A nutrition diagnosis, in contrast to a medical diagnosis, is written in terms of client problem for which nutrition-related activities provide the primary intervention. It focuses on nutrition issues that may be consequences of or contribute to diseases. It also addresses behaviors that impact food choices.

Differences between nutrition diagnosis and medical diagnosis

Medical Diagnosis	Nutritional Diagnosis
<ul style="list-style-type: none">A medical diagnosis describes a disease or pathology of organs. Interventions for medical diagnosis may take several forms such as medications, surgery and other therapeutic approaches and may incorporate nutrition intervention	<ul style="list-style-type: none">Nutrition diagnosis entails the nutrition professional identifying and labeling a specific nutrition diagnosis (problem) and taking responsibility for treating it independently with a nutrition intervention, the nutrition dx is ideally resolved
Diabetes	Excessive CHO intake r/t visits to Coldstone Creamery as evidenced by diet hx and high hs blood glucose
Trauma and closed head injury	Increased energy needs r/t multiple trauma as evidenced by results of indirect calorimetry
Liver failure	Altered gastrointestinal function r/t cirrhosis of the liver as evidenced by steatorrhea and growth failure
Obesity	Excessive energy intake r/t lack of access to healthy food choices (restaurant eating) as evidenced by diet history and BMI of 35.

Anorexia nervosa	Undesirable food choices r/t history of anorexia nervosa and self-limiting behavior as evidenced by diet history and weight loss of 5 lb.
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Nutrition diagnosis components

The nutrition diagnosis is expressed using nutrition diagnostic terms and the etiologies, signs, and symptoms that have been identified in the reference sheets describing each diagnosis. There are three distinct parts to a nutrition diagnostic statement:

- i) The nutrition diagnosis describes alterations in a patient's/client's status. A diagnostic label may be accompanied by a descriptor such as "altered," "excessive," or "inadequate."
- ii) The etiology is preceded by the words "related to."
- iii) Signs/symptoms (defining characteristics) The defining characteristics are a typical cluster of signs and symptoms that provide evidence that a nutrition diagnosis exists.
 - The signs and symptoms are preceded by the words "as evidenced by."
 - Signs are the observations of a trained clinician.
 - Symptoms are changes reported by the patient/client.

Characteristics of nutritional diagnosis statement

A well written nutrition Diagnostic Statement should be:

- a) Clear and concise to avoid misinterpretation and/or confusion
- b) specific so as to point towards the precise condition/problem
- c) accurately related and limited to one/single problem so as to ensure that each problem is handled conclusively
- d) Accurately related to one etiology
- e) Based on reliable, accurate assessment data i.e. based on signs and symptoms from the assessment data

How to develop a nutrition diagnoses

- o Evaluate nutrition assessment using critical thinking
- o Identify the problem(s)
- o State them each clearly and singularly
- o Focus on those that can be treated by nutritional intervention
- o Describe the signs and symptoms
- o Explore the etiology or cause
- o Again focus on a nutrition-related cause Not medical diagnosis.

The PES statement

This is a structured sentence that is used to summarize the nutrition problem. It clarifies a specific nutrition problem and logically links the nutrition diagnosis to nutrition intervention and to monitoring and evaluation.

This statement has 3 distinct components:

P (Problem): diagnostic label, describes in a general way an alteration in the nutritional status

Words commonly used: excessive, inadequate, and inappropriate

E (Etiology) – factors that contribute to the cause or existence of a particular problem

S (Signs and Symptoms) defining characteristics obtained from the subjective and objective nutrition assessment data

This information is obtained during the nutrition assessment phase of the Nutrition Care Process. This statement has a distinct format:

- Problem related to Etiology as evidenced by Signs and Symptoms

Evaluating PES statement

P (Problem): Can the nutritionist's/dietician's resolve or improve the nutrition diagnosis? Consider the "intake" nutrition diagnosis as the one more specific to the role of the Nutritionist/dietician.

E (Etiology): Is the etiology listed the "root cause"? Will the nutritionist's/dietician's intervention resolve or improve the problem by addressing the etiology? Can nutritionist's/dietician's intervention at least lessen the symptoms?

S (Signs and Symptoms): Will measuring the signs and symptoms indicate if the problem is resolved or improved? Are the signs and symptoms specific enough that the Nutritionist/dietician can monitor and document resolution or improvement of the nutrition diagnosis?

Does the nutrition assessment data support the specific nutrition diagnosis, etiology, and signs and symptoms?

Sample PES statements

1. Patient has involuntary weight loss (p) due to inadequate energy intake (E) as evidenced by eight pounds weight loss within 4 weeks (S).
2. Excessive Fat Intake (P) related to limited access to healthful options – frequent consumption of high-fat, fast-food meals (E) as evidenced by serum cholesterol level of 230 mg/dL and patient report of 10 meals per week of hamburgers and fries (S)
3. Excessive Energy Intake(P) related to unchanged dietary intake and restricted mobility while fracture heals (E) as evidenced by 5 lb weight gain during last 3 weeks due to patient report of consumption of 500 kcal/day more than estimated needs(S).

Critical thinking in nutrition diagnosis

To effectively develop a good nutrition diagnostic statement, the following should be considered;

- Finding patterns and relationships among the data and possible causes.
- Making inferences.
- Stating the problem clearly and singularly.
- Suspending judgment.
- Making interdisciplinary connections.
- Ruling in/ruling out specific diagnoses

Documentation

Documentation is an on-going process that supports all of the steps in the Nutrition Care Process. Quality documentation of the diagnosis step should be relevant, accurate, and timely. A nutrition diagnosis is the impression of nutrition/dietetics professionals at a given point in time. Therefore, as more assessment data become available, the documentation of the diagnosis may need to be revised and updated. Inclusion of the following information would further describe quality documentation of this step:

- Date and time; and
- Written statement of nutrition diagnosis.

Determination for continuation of care

Because the nutrition diagnosis step involves naming and describing the problem, the determination for continuation of care follows the nutrition diagnosis step. If a food and nutrition professional does not find a nutrition diagnosis, a patient/client may be referred back to the primary provider. If the potential exists for a nutrition diagnosis to develop, a food and nutrition professional may establish an appropriate method and interval for follow-up.

CASE STUDIES

Case study 1

Arianna was a healthy 16-year-old girl who was so happy to return to school this year. This is her junior year of high school, and she has been looking forward to attending the junior senior prom with Mike. Arianna is very active in cheerleading, Photo Club, gymnastics, and swimming. She has decided to join the Prom Committee this year so she can help plan the best prom that Wayne High has ever seen. Arianna has begun to look for prom dresses knowing that she will need to be saving every cent she can to afford the most perfect dress. Arianna has decided that she would like to lose a few extra pounds before the prom and decides to go on a strict diet. Arianna's friends have noticed that the once perky, playful superstar of the swimming team has been losing her "shine." She has dull, limp hair, which is a total change from the full head of shiny, bouncy black hair. Arianna has developed a complexion problem and has started using all kinds of acne products. Her skin is very oily and feels dirty all the time. Arianna's friends also noticed that she is not as pleasant as before, and Arianna has started to lose lots of her friends. Arianna's friend Ruth contacted Arianna's mother and told her of her concerns. Arianna's mother agreed that she had also noticed the changes and would

take Arianna to the doctor.

- a. What contributed to the development of the problems?
- b. Draw PES statement for Arianna's problems

Case study 2

Review the following cases:

Medical hx: 72 year old female admitted with decompensated CHF; heart failure team consulted; has been admitted with same dx 2x in past month; meds: Lasix and Toprol; current diet order: 2 grams sodium; has lost 5 pounds in 24 hours since admission; Output > input by 2 litres

Nutrition history: has been told to weigh herself daily but has no scale at home. Does not add salt to foods at the table. Noticed swollen face and extremities on day prior to admission. Day**// before admission ate canned soup for lunch and 3 slices of pizza for dinner; does not restrict fluids; has never received nutrition counselling

Nutrition diagnosis statements;

1. Excessive sodium intake r/t frequent use of canned soups and restaurant foods as evidenced by diet history.
2. Knowledge deficit r/t no previous nutrition education as evidenced by /*9*--8* frequent use of high sodium convenience foods and inability to name high sodium foods.
3. Excess fluid intake r/t dietary indiscretions as evidenced by diet history and current fluid status.
4. Self-monitoring deficit r/t lack of access to scale as evidenced by patient self-report.

Case study 3

Mr. T, a 45 year old man, 5ft 8 inches tall and weighing 178lb (BMI 27), is admitted to the hospital with chest pain. Mr. T gained 25 pounds over the last year. Labs: LDL 240, HDL 30, TG 350 BP 120/80.

Diet is poor, skips meals and eats large dinner meals.

PES statement: "Altered nutrition-related laboratory values (lipid profile) Related to undesirable food choices as evidenced by hyperlipidemia with elevated LDL and low HDL.

11.3.3.3 Self-Assessment

1. Define the following terms;
 - a. Diagnosis
 - b. Differential diagnosis
 - c. Nutrition problem



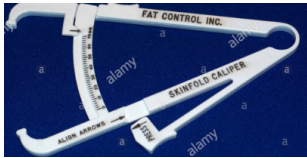
- d. Etiology
 - e. Client intrinsic factors
 - f. Symptoms
 - g. Drug-nutrient interaction
2. Intake domain of nutrition diagnosis entails _____
 - a. Nutrition problems that are related to medical or physical conditions
 - b. Problems that are related to knowledge, attitudes/beliefs, physical environment or access to food, and food safety
 - c. Actual problems related to excessive or inadequate intake compared to requirements (actual or estimated).
 - d. All of the above
 3. The following methods are used in collecting current dietary intake information (indicate true/false for each answer)
 - a. 24-hour recall
 - b. Food frequency questionnaire
 - c. Direct observation
 - d. None of the above
 4. Problem, definition of nutrition diagnosis label, etiology and signs/symptoms are all components of;
 - a. Nutrition diagnosis reference sheet
 - b. Medical diagnosis
 - c. Monitoring and evaluation
 - d. Nutrition diagnosis.
 5. The external factors influencing food choice include;
 - a. Culture and religion
 - b. Hunger and ethical decisions
 - c. Personal traits and economic factors
 - d. Education and aversion.
 6. Describe the rapid screening methods and tools used to determine underlying medical condition.
 7. Identify the diagnostic labels for the intake domain.
 8. Explain why ADA recommends the use of intake domain by dietitians/nutritionists.
 9. Explain the diagnostic labels for intake domain.
 10. Outline the components behavioral-environmental domain.
 11. Describe clinical domain of nutrition diagnosis.








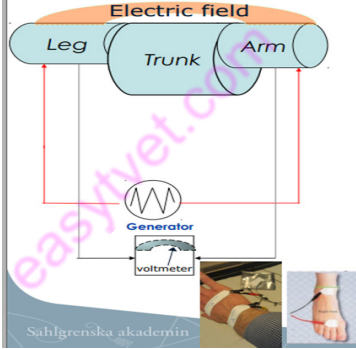
12. Discuss the client intrinsic factors that are related to nutritional problems.
13. Describe the influence of client extrinsic factors on an individual's nutritional status.
14. In which ways do food/nutrient interact positively?
15. Explain why it is difficult to use MUAC as a defining characteristic in older adults.
16. Discuss physical examination in light of the basis for signs and symptoms.

11.3.3.4 Materials

- Nutritional assessment data form
- Nutrition diagnoses reference sheets
- Stationery
- Clinical manual of 2013
- Metropolitan life insurance tables
- Computers with internet
- Library and resource Centre
- WHO guidelines
- MOH policies and guidelines
- Skills lab
- LCDs, video clips, charts and other teaching aids
- Invitation of competent expertise

Equipment

Microtoise	Stadiometers	Calipers
		

<p>Length boards</p> 	<p>Height Boards</p> 	<p>Weighing scales/Beam balance</p> 
<p>Adult MUAC tapes</p> 	<p>Color-coded measuring tapes</p> 	<p>Salter scale</p> 
<p>Children MUAC tapes</p> 	<p>Bio Impedance analysis machine</p> 	

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11.3.4 Learning Outcome 3: Conduct prescriptions for nutrition interventions

11.3.4.1 Learning Activities

Learning activity	Special instruction
<p>i) Prioritize and address nutrition needs</p> <ul style="list-style-type: none"> • Prescribe client’s daily requirements as per client conditions • Address clients’ immediate nutrition needs as per the nutrition diagnosis • Supplement clients levels of micronutrients and macronutrients as per client nutrition needs 	<ul style="list-style-type: none"> ➤ Provide and consider the client’s nutrition diagnosis ➤ Calculate energy requirements as per client condition ➤ Calculate client nutrient needs as per condition ➤ Provide macro and micronutrient supplement as per client’ need
<p>ii) Identify and select appropriate nutrition interventions</p> <ul style="list-style-type: none"> • Define nutrition intervention plan and related strategies as per work place procedures • Identify time and frequency of care as per client nutrition needs • Identify resources required as per client nutrition needs 	<ul style="list-style-type: none"> ➤ Provide alternatives of nutrition intervention ➤ Choose suitable nutrition intervention plan as per work place procedure and with consultation with the client ➤ Plan time and frequency of nutrition care ➤ Mobilize and document resources required
<p>iii) Design diet plans</p> <ul style="list-style-type: none"> • Review client’s nutritional status • Assist the client to identify self-care abilities and disabilities 	<ul style="list-style-type: none"> ➤ Review the nutrition diagnosis of the client ➤ Design a diet plan for the client putting into consideration all the assessment data ➤ Reinforce client’s abilities for self-care ➤ Address client’s self-care disabilities ➤ Prescribe the required self-care for the client
<p>i) Implement designed care plans</p> <ul style="list-style-type: none"> • Inform client, family and/or significant other of the implications of their admission to the health care setting • Discuss psychological, social and/or physical needs with clients • Share information regarding client nutritional status 	<ul style="list-style-type: none"> ➤ Plan the implementation with client, family and/or significant other ➤ Explain the care plan to client, family and/or significant other ➤ Highlight the financial implications of the preferred care plan ➤ Address client’s fears about the designed care plan ➤ Inform client, family and/or significant other of their roles in implementing the diet plan

	<ul style="list-style-type: none"> ➤ Address psychological, social and physical needs with the client ➤ Collaborate with the multidisciplinary team ➤ Consult relevant professionals on other factors that may affect efficacy of the care plan ➤ Record dietary modifications on relevant documents
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11.3.4.2 Information Sheet

Definitions

- **Nutrition intervention:** Planned actions designed with the intent of changing nutritional related problem e.g. nutritional counselling and education, therapeutic feeding, macronutrient and micronutrient supplementation, food by prescription, supplementary feeding, enteral and parenteral nutrition.
- **Nutrition care:** It is the use of nutrition knowledge in planning meals, managing diseases and maintain health
- **Energy Intake:** the dietary energy intake that is required to meet normal needs in a healthy person of a defined age, gender weight, height, and level of physical activity
- **Recommended Dietary Allowance (RDA):** The amount of a nutrient needed to meet the requirements of almost all (97% to 98%) of the healthy population
- **Macronutrients:** Nutrients required in considerably large quantities. They are measured in grams. They are: carbohydrates, proteins and fats
- **Micronutrients:** These are nutrients required in small amounts. They are minerals and vitamins
- **Supplements:** These are food products that are intended to complement the diet
- **Calorie:** it is a unit of energy clients' get from the food and beverages they consume

Nutrition intervention

Nutrition intervention is carried out to manage the nutritional problem through counselling, education and dietary modification to meet a client's nutritional requirement.

An individual's nutritional status is assessed, after which a nutrition diagnosis is made. Once the nutrition problem has been identified, the nutritionist then considers alternative solutions to the problem.

Critical thinking helps to determine the strengths and weaknesses of each intervention. Intervention translates assessment data into strategies, activities, or interventions that will

enable the patient or client to meet the established objectives. Client-driven process is key during interventions.

Interventions should be specific:

- What?
- When?
- Where?
- How?

Objectives of nutrition intervention

- Should be patient-centered
- Must be achievable
- Stated in behavioral terms, quantifiable terms
- Patient and counselor must establish goals together
 - o may involve other members of health care team
- Show what the patient will do or achieve if objectives are met

Sample objectives of nutrition intervention

Problem 1: Involuntary weight loss

Objectives:

1. Patient will stop losing weight and begin to gain weight slowly, to a target weight of 145lb
2. Patient will modify his diet to increase intake to meet calorie and protein needs

Problem 2: Inadequate protein-energy intake secondary to poor appetite

Objectives:

3. Patient will attend senior center for lunch daily to improve socialization and calorie intake
4. Patient will include nutrient-dense foods in his diet

Nutrition intervention strategies

- Prioritize nutrition diagnoses
- Consult the ADA guidelines
- Determine patient-focused expected outcomes
- Confer with family members/caregivers
- Define nutrition plan and strategies

Steps of nutrition intervention

Three main steps are followed during nutrition intervention;

1. Selecting
2. Planning
3. Implementing

I) SELECTING

The nutrition intervention chosen is based on the nutrition diagnosis and uses as well as team involvement, science based principles and additional research, if available. The key element is that the nutritionist improves the issue by creating a rational plan with the help of the whole family including the individual.

Nutrition intervention strategies are selected to change nutritional intake, nutritional related knowledge for behaviour or environmental conditions or access to supportive care and services

Nutrition intervention goals provide the basis for monitoring progress and measuring outcomes.

There are four domains of nutrition intervention:

- 1) **Nutritional counselling;** this is a supportive process characterized by collaborative counsellor- client relationship to establish food, nutrition and physical activity priorities, goals and individual action plans that acknowledge and foster responsibility for self-care to treat an existing condition
- 2) **Nutrition education:** this is a formal process to instruct a client in a skill or to impart knowledge to help client voluntarily manage or modify food, nutrition and physical activity choices and behaviour
- 3) **Food and nutrient provision:** this is an individualized approach for food/nutrient provision
- 4) **Coordination of nutrition care;** this is consultation with, referral to or coordination with nutrition care with other health care providers that can assist in treating nutrition related problems

Nutrition Counselling:

The GALIDRA approach

Galidra has proven effective in many settings and captures the essential elements of effective counseling interactions. It can be adapted as needed for other languages.

- **Greet** the client. Ask him or her to sit down and then exchange introductions to establish a comfortable atmosphere.
- **Ask** the client about his or her situation and current practices using open-ended questions and familiar language.
- **Listen** to what the client and/or caregiver say. Notice body language, use probing questions, and reflect back what the client says to make sure you understand it correctly.

- **Identify** the client's key problems and help select the most important ones to address.
- **Discuss** options, considering what is realistic and using visual materials to engage the client and/or caregiver in discussion.
- **Recommend and negotiate** a small, doable action, explaining the rationale and benefits.
- **Ask** the client to repeat what he or she understood from the discussion and what action he or she **Agrees** to try at home.
- **Make** a follow-up Appointment and ask the client to repeat the date.

Food and Nutrient Provision

There are two forms of selective feeding programmes:

- Supplementary Feeding
- Therapeutic Feeding Programmes

Supplementary feeding programmes (SFPs)

- Provide nutritious food in addition to the general ration
- Supplementary Feeding Programmes (SFPs)
- They aim to rehabilitate malnourished persons or to prevent a deterioration of nutritional status
- SFPs are short-term measures and should not be seen as a means of compensating for an inadequate general food ration.

II) PLANNING

More effort should go into planning and it should entail;

- Prioritizing the nutrition diagnoses, setting goals and defining the intervention strategy
- Arranging problems in the order of importance and urgency for the client
- Detailing the *nutrition prescription* (states patient/client's recommended dietary intake of energy, nutrients, etc.)
- Using the ADA's evidence-based practice guidelines
- Setting goals that are measurable, achievable and time-defined
 - Ideal Goals – science based values intended to control or improve specific health conditions
 - Expected Outcomes – the desired change(s) to be achieved over time as a result of nutrition intervention

III) IMPLEMENTING

This step focuses on carrying out and communicating the plan of care

Nutrition needs

Identifying nutritional problem and assessing the nutritional status of a client important in a clinical setting. With therapeutic diets we need to add or limit certain health conditions. Calories are essential for human health; all individuals require different amounts of energy each day depending on age, sex, and size and activity level.

Factors That Affect Energy Needs

- **Age:** children and teenagers need more energy due to their high metabolic rate to support growth peak
- **Sex;** male adult needs more energy due to their body composition, which is mainly muscle, compared to women who have considerably higher body fat than muscle..
- **Pregnancy and lactation:** pregnant women need more energy due to meet her own needs and also support the foetus
- **Occupation:** an individual's activity level determines their energy requirements. Physically active individuals consume more energy than individuals who lead a sedentary lifestyle.
- **Size or body weight:** a person smaller in size has a larger surface area per unit volume. Thus, the rate of heat loss is high, which leads to more energy expenditure.
- **Climate:** people living in cold countries need more energy to maintain body temperature.
- **Health:** Diseases which cause catabolism consume more energy and so ill people may require more energy than healthier persons

The numbers of calories in food informs how much potential energy they contain. The caloric content of the macronutrients is:

- 1g of CHO contains 4 Kcal
- 1g of Protein contains 4 Kcal
- 1g of fat contains 9 Kcal

Characteristics of Energy Requirements:

1. They change with increasing age between birth and maturity, in periods of growth when new tissues are being laid down.
2. Requirements are higher per unit of body weight than they are after growth has ceased
3. In mature female requirements increase during pregnancy as foetus grows, they also increase during lactation in proportion to the amount of milk produced

Basal Metabolic Rate: This is the energy required when the body is at complete rest. It is the energy that maintains all body processes when no physical activity is being carried out.

Energy for circulation and respiration constitute 60-70% of this expenditure

Factors affecting BMR

- Body size-the larger the body size the higher the BMR
- Body composition-lean body mass has higher BMR than adipose mass
- Age-energy expended per unit of body weight decreases from birth to old age
- Climate cold temperatures result in higher BMR as a compensatory mechanism
- **Disease and infection;** Disease and infection increase BMR as the body deals with the physiological stress that results. During fever BMR increase by about 7% for every 1% rise in temperature. Tumors as seen in cancer and burns on the skin also increase BMR
- **Physiological and hormonal status:** Hormonal function influences the rate at which the body consumes energy, even while at absolute rest. e.g. In endocrine gland disorder such as hyper or hypothyroidism. During pregnancy and lactation BMR increases
- **Psychological state :** Acute anxiety stimulates energy expenditure

Determining a Person's BMR:

There are two formula used to determine the BMR of a person

1.

Men:

Weight (kgs) x 1kcal/kg body weight x 24hrs

Women: Weight (kgs) x 0.95kcal/kg body weight x 24hrs

2. Harris benedict equation (1919)

Men

REE(kcal) = 66.5+(13.75xw)+(5.0xh)-(6.7xa)

Women

REE(kcal)= 655+(9.56xw)+(1.85xh)-(4.68xa)

Where w=weight in kgs

H=height in cm

A= age in years

Physical activity level

Physical activities account for 20-40% of body energy expenditure. Amount expended depends from one person to another

For example, the amount of energy spent on physical activity depends on body size. Extra energy is expended by larger persons

When expressed as a percentage of BMR. The activity level is:

Activity level	Energy lost(%of BMR)
Sedentary	20%
Light	30%
Moderate	40%
Heavy/very active	50%

Thermic Effect of Food:

The body also burns calories every time you eat. This is referred to as the Thermic Effect of Food or the thermogenic effects of food. Digestion and processing of nutrients has a certain cost in the form of calories.

It is calculated as: 10% of (REE+ activity level)

Determining Energy Requirement:

The total daily energy requirement is commonly estimated by adding the REE and the energy required for physical activity and Thermic Effect of Food (TEF)

REE can be estimated by:

Harris benedict equation (1919)

1. Men

$$REE(kcals)=66.5+(13.75xw)+(5.0xh)-(6.7xa)$$

2. Women

$$REE(kcals)= 655+(9.56xw)+(1.85xh)-(4.68xa)$$

Where w=weight in kgs

H=height in cm

A= age in years

Example

1. Using Harris Benedict Equation, determine the TEE for a 20 yrs old woman who is 165 cm and 55kg heavy with a light activity level

Using Harris benedict equation

$$REE(Kcals)= 655+(9.56xw)+(1.88xh)-(4.68xa)$$

$$655+(9.56x55)+(1.88x165)-(4.68x20)$$

$$655+525.8+310.2-9.36$$

$$REE=1397.4(A)$$

$$30\% \text{ OF } 1397.4 = 417.7(B)$$

$$10\%(A+B)= 10/100X(417.7+1397.4)=181.51$$

$$TEE=A+B+C$$

$$1397.4+417.7+181.51$$

$$1996.61$$

Tools Used in Determining Daily Intake

1. Dietary reference intake (DRI)

- This is a set of four separate reference values used to plan and evaluate diets.
- DRI estimates the nutritional requirements of healthy people
- Include separate recommendations for different groups of people of a specific age & gender
- Encompasses four sets of values: Recommended Dietary Allowance (RDAs), Estimated Average Requirement (EAR), Adequate Intake (AI) and the Upper and Lower Intake level.

2. Daily food guide

Daily food guide helps the planner achieve dietary adequacy, balance and variety.

Daily food guide includes most notable nutrients within each food group, the number of servings recommended, the size of servings, and the foods within each group categorized by nutrient density.

It also gives the average range of servings per day for the different food groups

Food group	Major nutrients	Servings per adult	Servings per child	One serving equivalent 1 cup/glass = 250 ml
Water		8		
General starchy foods bread, cereals and other grains	<ul style="list-style-type: none"> • Carbohydrates • Vitamin (B1) • Iron • Niacin 	6-11	6	<ul style="list-style-type: none"> • 1 slice bread, • ½ cup cooked cereals, pastas or rice, ¾ to 1 cup • potatoes, green bananas, • 2 small 3 inch pancakes. • 1 cup ready to eat cereals
Milk and milk products	<ul style="list-style-type: none"> • Calcium • Riboflavin (Vit B2) • Vitamin B12, • Proteins, • fats 	2-4	2	<ul style="list-style-type: none"> • 1 cup : <ul style="list-style-type: none"> ○ fresh milk, ○ fermented milk or ○ yoghurt

Daily Food Guide

Design diet plan

Diet planning involves prescriptions and description of modified diets such as clear liquid diets, full liquid diet, light/soft diets, high calorie diet, calorie restricted diet, high protein diet, low protein diet, sodium restricted diets, fat restricted diets, fiber restricted diets, high fiber diets, bland diets and elimination of suspect foods for allergies.

The frequency of feeding and quantities should also be determined.

1. Clear liquid diet

Description

Designed to provide fluids mainly in the form of sugar and water to prevent over-stimulating extensive digestive processes, minimize colonic residue, relieve thirst, and provide oral feedings that promote the return to the normal ingestion of food .

Provides 700 to 1,000 kcal.

Indications

The Clear Liquid Diet is indicated for the following:

- Short-term use when an acute illness or surgery causes an intolerance for foods (eg, abdominal distention, nausea, vomiting, and diarrhea)
- To temporarily restrict undigested material in the gastrointestinal tract or reintroduce foods following a period with no oral intake when poor tolerance to food , aspiration, or an anastomotic leak is anticipated
- To prepare the bowel for surgery or a gastrointestinal procedure

2. Full Liquid Diet

Description

It consists of foods that are liquid at body temperature, including gels and frozen liquids. The diet provides nourishment that is easy to consume and digest with very little stimulation to the gastrointestinal tract.

Indications:

- Used following oral surgery or plastic surgery of the face or neck area in the presence of chewing or swallowing dysfunction for acutely ill patients.
- The Full Liquid Diet has been traditionally used as a postoperative transitional diet.
- It is intended for short-term use only; therefore, attempts are not usually made to increase the variety of foods offered to provide for the total adequacy of nutrients.

3. Soft Diet

Description

It is a modified diet fit for clients with difficulty chewing or swallowing, or for those who have undergone surgery of the jaw. For the greatest variety of foods, all foods that are easily masticated are included in the diet.

Indications

- For patients who have difficulty chewing or swallowing.

4. High-protein, high-calorie diet

Description

Additional proteins and energy are added to meals or given in between meals. This increase daily energy and protein consumption.

Indications

- When individual needs for proteins and energy are increased by physiological conditions such as stress, trauma, protein loss and catabolism. This may be necessary for patients suffering from:
 - protein-energy malnutrition
 - failure to thrive
 - cancer
 - burns
 - cystic fibrosis
 - human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS)
 - chronic gastrointestinal diseases

5. Sodium-Controlled Diet

Description

This type of modified diet is intended to reduce an individual's sodium intake due to various factors. Foods naturally high in sodium as well as sodium-rich food additives are restricted. It is a commonly prescribed diet in hypertension

Indications

For management of conditions that cause fluid retention such as :

- cirrhosis of the liver with ascites
- heart failure
- hypertension
- renal disease

6. Calorie Controlled Diet

Description

The diet is modified by reducing energy intake by reducing the amount of fat and carbohydrates in the diet. Other nutrients such as proteins, vitamins and minerals are maintained at normal levels.

It is the preferred diet in weight management and other conditions in which weight management improves prognosis. It is often accompanied by physical activity and behaviour change.

In overweight and obese persons, weight loss is recommended to:

Indications

- lower blood pressure in patients with hypertension
- lower total cholesterol, low-density lipoprotein cholesterol, and triglycerides levels in patients with hyperlipidemia
- lower blood glucose levels in patients with type 2 diabetes
- prevent liver disease

7. Fat-controlled diet

Description

This diet restricts the total amount of fat in the diet, although the quality of fat is not considered.

Indications

For patients who are unable to properly digest, metabolize, and absorb fat as seen in diseases of the liver, gall bladder and the pancreas, intestinal mucosa and lymphatic system which impair fat digestion and absorption.

8. High-fiber diet

Description

A high fibre diet is characterised by increased fibre intake through consumption of fibre rich foods or supplementation with fibre.

Indications

- Cardiovascular diseases
- Diabetes Mellitus
- Weight management
- Bowel-related diseases

9. Fiber-restricted diets

Description

This type of diet reduces the amount of fibre to less than 10 grams per day. Foods high in fibre are eliminated from the diet while foods low in fibre such as animal products, processed grains and cereals, selected fruits and vegetable are consumed.

Indications

- To prevent the formation of an obstructing bolus when the intestinal lumen is narrowed.
- To delay intestinal transit time in conditions of diarrhea.
- To reduce (not eliminate) the fiber in the colon pre- and postoperatively.
- To allow the bowel to rest during acute exacerbation of inflammatory bowel disease, acute phases of diverticulitis, or radiation enteritis.

10. Protein-controlled diet

Description

This diet controls the quality and quantity of proteins consumed to reduce nitrogenous wastes and support healing.

Adequate non-protein energy is provided to promote protein sparing.

Indications

Applied in management of hepatic encephalopathy associated with hepatic disorders, such as:

- Hepatitis
- Cholestasis liver disease
- Cirrhosis with acute and/or chronic encephalopathy

11.3.4.3 Self-Assessment

1. Define the following terms
 - A. Nutrition intervention
 - B. Supplements
 - C. Nutrition care
 - D. Basal metabolic rate (BMR)
2. The following are strategies of nutrition intervention (indicate true/false for each)
 - A. Prioritize nutrition diagnoses
 - B. Consult the ADA guidelines
 - C. Determine patient-focused expected outcomes
 - D. None of the above

3. Prioritizing the nutrition diagnosis, setting goals and defining the intervention strategy is a component of the _____ step of nutrition intervention
 - A. Planning
 - B. Interpretation
 - C. Selecting
 - D. Implementing
4. The caloric content of five grams of fat is _____
 - A. 9 Kcal
 - B. 4 Kcal
 - C. 20 Kcal
 - D. 45 Kcal
5. Physical activities account for _____ of body energy expenditure
 - A. 5-10%
 - B. 10-30%
 - C. 20-40%
 - D. 30-50%
6. When an individual eats food the body burns calories which is known as _____
 - A. REE
 - B. TEF
 - C. BMR
 - D. TER
7. Determine the energy requirements for
 - A. 25 years old male weighing 50 kgs, height 140 cm, heavy activity level
 - B. 30 year old female , weight 57kgs, height 150cm , light activity
 - C. 60 year old male , weight 176.37 pounds, height 160cm ,light activity
8. Explain the 4 domains of nutrition intervention
9. Explain the factors influencing basal metabolic rate (BMR)
10. Outline the factors that influence individual energy needs

11.3.4.4 Tools, Equipment, Supplies and Materials

- Kenya National Clinical Nutrition and Dietetics Manual, MOH 2010
- Clinical manual of 2013
- Computers with internet

- Library and resource Centre
- WHO guidelines
- MOH policies and guidelines
- Skills lab
- LCDs, video clips, charts and other teaching aids
- Invitation of competent expertise

Equipment

<p>Microtoise</p> 	<p>Stadiometers</p> 	<p>Calipers</p> 
<p>Length boards</p> 	<p>Height Boards</p> 	<p>Weighing scales/Beam balance</p> 
<p>Adult MUAC tapes</p> 	<p>Color-coded measuring tapes</p> 	<p>Salter scale</p> 
<p>Children MUAC tapes</p> 	<p>Bio Impedance analysis machine</p> 	

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easyvet.com

11.3.5 Learning outcome 4: Conduct monitoring dietary assessment

11.3.5.1 Learning Activities

Learning activity	Special instruction
i) Do daily monitoring of the patients uptake and response to the interventions <ul style="list-style-type: none"> • Assess anthropometric measurement outcomes • Evaluate nutrition related diet history • Evaluate biochemical outcomes • Evaluate physical and clinical outcomes 	<ul style="list-style-type: none"> ➤ Consider the intervention plan, resource materials, policies and guidelines ➤ Conduct anthropometric reassessment ➤ Compare anthropometric measurements to goals of the care plan ➤ Conduct dietary assessment ➤ Compare outcome of dietary assessment to goals of the care plan ➤ Interpret biochemical outcomes ➤ Compare biochemical outcomes to goals of the care plan ➤ Conduct assessment for significant physical and clinical signs ➤ Compare physical and clinical findings to goals of nutrition care
ii) Do nutrition prescriptions and documentation	<ul style="list-style-type: none"> ➤ Review the intervention plan against the outcomes ➤ Prescribe nutrition that could address any pending goals ➤ Document the overall outcome of nutrition care

11.3.5.2 Information Sheet

Definitions

- **Nutrition Monitoring:** pre-planned review and measurement of selected nutrition care indicators of patient/client's status relevant to the defined needs, nutrition diagnosis, nutrition intervention, and outcomes.
- **Nutrition Care Outcomes:** the results of nutrition care that are directly related to the nutrition diagnosis and the goals of the intervention plan
- **Nutrition Care Indicators:** markers that can be measured and evaluated to determine effectiveness of nutrition care

CONTENT

Nutrition Monitoring

During monitoring one determines the degree to which progress is being made and whether or not the client's goals or desired outcomes of nutrition care are being met. It means much more than merely "watching" what is happening.

It requires an active commitment to measuring and recording the appropriate outcome indicators relevant to the nutrition diagnosis' signs and symptoms.

A nutrition reassessment is needed to identify whether the nutrition-related problem still exists and evaluate the progress made toward resolving the problem.

It determines whether the patient is meeting the nutrition intervention goals or desired outcome by asking the question;

- o Is the nutrition intervention strategy working to resolve the nutrition diagnosis, its etiology, and/or signs and symptoms?

The patient's progress should be assessed by comparing specific markers or nutrition care indicators against recognized, science-based standards or baselines.

Progress should be:

- Monitored
- Measured
- Evaluated on a planned schedule

Purpose of monitoring and evaluation

- To determine whether progress made is related to the patient's nutrition intervention goals and/or desired outcomes.
- To provide evidence if the intervention is/has been effective in changing the behavior or status of the patient.
- To evaluate nutrition care outcomes.
- To create a standardized language for nutrition intervention.

Types of Monitoring;

- **Process monitoring:** Assesses the 'how' of nutrition intervention. It queries the flow of activities towards the set goals while noting discrepancies
- **Impact monitoring:** assesses the impact of the nutrition intervention. Impact monitoring focuses on changes such as behaviour change and change in nutrition indicators of interest.

Importance of Monitoring in Nutrition Care

- Helps in decision making on the continued interventions
- To determine programme strengths and weaknesses

- To assess resource utilization
- Used to measure programme outcomes
- To review strategies
- To observe the trends of the programme
- It helps the nutritionist to improve their effectiveness and efficiency in addressing nutrition problems

Data sources in nutrition monitoring and evaluation

To monitor and evaluate a patient/client's progress, the following tools may be used:

- Patient/client questionnaires
- Surveys
- Pretests and posttests
- Patient/client/family member interviews
- Anthropometric measurements
- Biochemical and medical test results
- Food and nutrition intake tools.

Relationship between monitoring, measuring and evaluation

- **Monitoring** provides findings that the nutrition intervention has impacted the patient's status positively or negatively
- **Measuring** outcomes by using data from the nutrition care indicators
- **Evaluate** patient outcomes by comparing current findings with previous status/behavior and patient's nutritional intervention goals.

Components of nutrition monitoring & evaluation

1. Monitor Progress: towards the nutrition intervention/goal

- Determining that the goals and outcomes that are anticipated by the client and the dietetics professionals are indeed occurring
- Monitor, measure and evaluate on a planned schedule

2. Measure Outcomes: the appropriate nutrition care indicators

- Data is collected over time
- Nutrition, clinical and health status, patient/client centered, and health care utilization

3. Evaluate Outcomes:

- Evaluate the nutrition care indicators against appropriate standards selected during the nutrition care planning

- To determine what changes have occurred as a result of the nutrition intervention
- Comparing the current findings with the previous signs and symptoms
- Create outcomes management system
- Contribute to the body of evidence based research

Monitoring and evaluation outcomes

1. Food/Nutrition –Related History Outcomes: Food and nutrient intake, supplement intake, physical activity, food availability, etc
2. Nutrition-Focused Physical Finding Outcomes: Physical appearance, swallow function, appetite
3. Biochemical Data, Medical Tests & Procedure Outcomes: Lab data and tests
4. Anthropometric Measurement Outcomes: Height, weight, BMI, growth pattern, weight history
5. Nutrition care outcomes: intermediate outcomes to other broader health care outcomes
 - Acute or chronic disease: occurrence, duration, severity
 - Infections
 - Wound healing
 - Health care cost
 - Patient functional ability

Nutrition care outcome categories of monitoring and evaluation

- Determine proper indicator/measures
- Determine suitable data for comparison
- Determine the process of the clients relating to expected outcomes
- Determine why the patient outcomes are different from the expected outcomes
- Determine issues that assist or hamper improvement
- Determine how long a patient needs to be under nutrition care

Nutrition care outcome characteristics

- Represent results the nutritionist/dietician can impact
- Can be linked to nutrition intervention goals
- Are measureable with tools and resources available to the nutritionist/dietician
- Occur in a reasonable time period

Nutrition care indicators in monitoring and evaluation

- Factors that food and nutrition professionals can impact directly, such as food and nutrient intake; growth and body composition; food and nutrition-related knowledge, attitudes, and behaviors; and food access
- Laboratory values, such as HgbA1c, hematocrit, or serum cholesterol
- Functional capabilities, such as physical activity
- Patient perception of nutrition care and results of nutrition care, such as nutrition quality of life

Measurement and Evaluation of Nutrition Indicators:

- Nutrition Care Criteria – what it is compared against for example
 - o Nutrition Prescription or Goal which could be;
 - Dietary Intervention
 - Behavior change
 - o Reference Standard: select what is appropriate for intervention or goal which could be;
 - National
 - Institutional
 - Regulatory standards

Critical thinking skills for Nutrition Monitoring & Evaluation:

- Selecting appropriate indicators/measures
- Using appropriate criteria (previous status, nutrition intervention goals, or reference standards) for comparison
- Defining where patient/client is now in terms of expected outcome
- Explaining variance from expected outcomes
- Identifying factors that help/hinder progress
- Deciding between discharge or continuation of nutrition care

Nutrition monitoring and evaluation reference sheets

These reference sheets are combined with the nutrition assessment reference sheets and contain these eight components:

1. Definition of the nutrition assessment and nutrition monitoring and evaluation term
2. The nutrition assessment and nutrition monitoring and evaluation indicators
3. Measurement method or data sources recommended

4. The nutrition interventions with which the nutrition assessment and nutrition monitoring and evaluation data are used
5. The nutrition diagnoses with which the nutrition assessment and nutrition monitoring and evaluation data are used
6. The criteria for evaluation
7. The patient/client nutrition assessment and nutrition monitoring and evaluation documentation example
8. References

Documentation

Quality documentation for nutrition monitoring and evaluation includes the following:

1. Date and time of activity
2. Specific indicators measured, results, and the method for obtaining the measurement
3. Progress towards goals: Criteria to which the indicator is compared (nutrition prescription/goal or a reference standard)
4. Factors facilitating or hampering progress
5. Other positive or negative outcomes
6. Future plans for nutrition care, nutrition monitoring, and follow-up or discharge

11.3.5.3 Self-Assessment

1. Define the following terms;
 - A. Nutrition care outcomes
 - B. Nutrition care indicators
2. During _____ one determines the degree to which progress is being made and whether or not the client's goals or desired outcomes of nutrition care are being met
 - A. Monitoring
 - B. Planning
 - C. Intervention
 - D. Evaluation
3. _____ queries the flow of activities towards the set goals while noting discrepancies
 - A. Impact monitoring
 - B. Impact evaluation
 - C. Process monitoring
 - D. Process evaluation

4. The following are the components of nutrition monitoring and evaluation (indicate true/false for each answer)
 - A. Prescribe outcomes
 - B. Assess outcomes
 - C. Measure outcomes
 - D. Evaluate outcomes
5. Measurement method or data sources recommended, the nutrition interventions with which the nutrition assessment and nutrition monitoring and evaluation data are used and the nutrition diagnoses with which the nutrition assessment and nutrition monitoring and evaluation data are used are components of;
 - A. Nutrition diagnosis reference sheets
 - B. Nutrition evaluation reference sheets
 - C. Nutrition intervention and monitoring reference sheets
 - D. Nutrition monitoring and evaluation reference sheets
6. Distinguish between monitoring and evaluation
7. Outline the importance of monitoring and evaluation
8. Why is monitoring and evaluation important in nutrition care process?
9. Highlight the critical thinking skills for nutrition monitoring and evaluation
10. Discuss the components of nutrition monitoring and evaluation sheets

11.3.5.4 Tools, Equipment and Materials

1. Nutritional assessment data form
2. Weighing scale
3. Colour coded measuring tape
4. Stationery
5. Computers with internet
6. Library and resource Centre
7. WHO guidelines
8. MOH policies and guidelines
9. Skills lab
10. LCDs, video clips, charts and other teaching aids
11. Invitation of competent expertise

11.3.5.5 References

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11.3.6 Learning Outcome 5: Conduct evaluation for the entire nutrition care process

11.3.6.1 Learning Activities

Learning activity	Special instruction
i) Assess outcomes of the entire nutrition care process	<ul style="list-style-type: none">➤ Evaluate the entire process of nutrition intervention and nutrition care process➤ Evaluate the outcomes of the nutrition care and document the outcome➤ by comparing current findings with previous status/behavior and patient's nutritional intervention goals
ii) Make and document appropriate decisions	<ul style="list-style-type: none">➤ Conclude on the effectiveness of nutrition care process➤ Remember to circulate the document to the relevant offices

11.3.6.2 Information Sheet

Definitions

- **Evaluation:** Evaluation is the systematic process of assessing the relevance, effectiveness, efficiency and impact of a nutrition intervention against set goals. The outcome helps to make the decision to discharge the client or to modify the care plan.
- **Nutrition Evaluation:** the systematic comparison of current findings with the previous status, nutrition intervention goals, effectiveness of overall nutrition care, or a reference standard

Content

The adoption and consistent use of the NCP promotes and strengthens nutrition communications among health professionals, their clients, and other customers.

In order to conduct evaluation of the entire nutrition care process, the nutrition outcomes and associated indicators must be checked;

Outcome	Indicators
Weight change	Weight Weight change Body mass index
Blood glucose control	Post-prandial blood glucose Hemoglobin A1c Mean blood glucose Number of hypoglycemic events
Dietary fat intake	Types of foods/meals Amount of fat in foods consumed Amount of fat in meals consumed Total fat intake
Knowledge regarding modified diet	Pre-test score Post-test score Self-indicated level of knowledge

Types of Evaluation:

- **Context evaluation:** Context evaluation is concerned with the assessment of existing information of the funding agency, the target group and the general programme environment.
- **Formative evaluation:** This is the day to day running of the programme towards acquisition of short term objectives therefore assess programme input, output or services and the general events in the programme environment
- **Impact evaluation:** Determine the ultimate effect on the beneficiaries in the long term. It is concerned with ultimate programme indicators.

Importance of Evaluation:

- Provide useful information for other ongoing or future interventions
- To provide useful information to the interdisciplinary medical care team
- To determine whether the intervention was successful or not

Nutrition care outcome management system

Potential benefits of aggregate nutrition care indicator data include the following:

- Provide for process improvement and foster understanding of what works and what does not

- Can be used for outcomes measurement studies and quality improvement initiatives
- Link care processes and resource utilization
- Give an opportunity to identify and analyze causes of less than optimal performance and outcomes
- Define information for inclusion in centralized data systems relevant to nutrition care
- Can be used to quantify the food and nutrition professional's contribution to health care.

Factors that can impact aggregate nutrition care indicator data interpretation include:

- Method for collecting the outcome (diet record, recall)
- Data source (patient, family/caregiver, chart)
- Intervention components (type, duration, and intensity)
- Education and skill level of nutritionist/dietician
- Nutrition program attributes

Evaluating the nutrition diagnosis statement

- P (Problem): Can the RDN resolve or improve the nutrition diagnosis? Consider the “intake” nutrition diagnosis as the one more specific to the role of the Nutritionist/dietician.
- E (Etiology): Determine if this is the “root cause” for the problem. If addressing the etiology will not resolve the problem, can the Nutritionist/dietician intervention lessen the signs and symptoms?
- S (Signs and Symptoms): Will measuring the signs and symptoms indicate if the problem is resolved or improved? Are the signs and symptoms specific enough that the Nutritionist/dietician can monitor and document resolution or improvement of the nutrition diagnosis?

In summary,

- Nutrition Monitoring and Evaluation describes the patient's progress through consistent terms that are evaluated based on carefully selected indicators and criteria.
- Documentation of patient progress and outcomes with consistent terminology that can be collected using research methodology will result in documenting the value of the work of the nutritionist/dietician

Documentation

This is an ongoing process to support the steps of the nutrition care process. A standardized language now part of NCP improves both written and oral communication among members of the health care team as well as communication with the patient.

Documentation should be Relevant, Accurate, and Timely

Variety of documentation Formats are acceptable:

- SOAP notes
- Focus notes
- PIE
- ADIME – what is laid out by the NCP
- ADA would like to be using this
- Electronic Medical Records

SOAP Note Format

Subjective (S):

- Patient information or data collected from the patient or caregiver
- Have no proof of

Objective (O):

- Empirical information, information drawn from physical tests and medical staff observations that are of consequence to the patient's nutritional status
- Have proof of

Assessment (A):

- Nutrition diagnosis or interpretation of the patient's nutrition problems
- PES Statement

Plan (P)

- An outline of interventions necessary to treat each nutrition problem
- What you plan to do

ADIME Note Format

This format is organized to reflect the Nutrition Care Process

Assessment (A)

- Relevant data about the patient's condition

Diagnosis (D)

- PES Statements listed and prioritized

Intervention (I)

- Documentation of the specific treatment goals and expected outcomes, interventions, and response of the client

Monitoring and Evaluation (M)

- Documentation of progress toward goals
- Factors that are facilitating or hampering progress
- Changes in the client's level of understanding or behavior
- Future plans for care

Other documentation styles

- DAR – diagnosis, assessment, recommendations
- PIE – problem, intervention, evaluation
- PGIE – problem, goal, intervention, evaluation
- content is the same regardless of recording style)

How to correct an error in the medical record

- It should not be erased.
- Draw a line through it and write error over it.
- Put correct information, date of correction, and signature.

11.3.6.3 Self-assessment

1. Define the following terms;
 - A. Evaluation
 - B. Nutrition outcome
2. _____ is concerned with the assessment of existing information of the funding agency, the target group and the general programme environment.
 - A. Formative evaluation
 - B. Monitoring
 - C. Context evaluation
 - D. Impact evaluation
3. Documentation should have the following qualities except?
 - A. Relevant
 - B. Accurate
 - C. Timely
 - D. Current

4. The following questions should be asked when evaluating a signs and symptoms in nutrition diagnosis statement (indicate true/false for each)
 - A. Will measuring the signs and symptoms indicate if the problem is resolved or improved?
 - B. Are the signs and symptoms specific enough that the Nutritionist/dietician can monitor and document resolution or improvement of the nutrition diagnosis?
 - C. Can the RDN resolve or improve the nutrition diagnosis?
 - D. If addressing the etiology will not resolve the problem, can the Nutritionist/dietician intervention lessen the signs and symptoms?
5. Describe the factors one should look out for in order to evaluate quality documentation for nutrition monitoring and evaluation
6. Discuss the potential benefits of aggregate nutrition care indicator data
7. Explain the factors that impact aggregate nutrition care indicator data interpretation
8. State what the following documentations mean in nutrition care process
 - A. DAR
 - B. PIE
 - C. PGIE
9. How should an error be correct in the medical record?

11.3.6.4 Tools, Materials and resources

1. Computers with internet
2. Library and resource Centre
3. WHO guidelines
4. MOH policies and guidelines
5. Skills lab
6. LCDs, video clips, charts and other teaching aids
7. Stationery
8. Invited expert

11.3.6.5 References

ADA (2008) Nutrition Care Process and Model Part I: The 2008 Update. *Journal of the American Dietetic Association*. Retrieved on 25th September 2019

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