**Assessment on Human Nutrition: Module 4**

**Submitted by Madit Majur Gabriel**

**Admission No. AIPMS/192/2018**

**Under the Supervision of Mr. Stephen Muchami**

**Course Moderator – Capacity Africa Institute**

**Submitted to the department of Nutrition for partial fulfillment and requirement for Diploma in Human Nutrition.**



**Department of Nutrition**

**Africa Institute for Project Management Studies**

**Muthaiga Shopping Complex, Limuru rd 4th floor Nairobi, Kenya,**

**January, 2019**

ASSIGNMENTS

1. **Identify at least four characteristics of a healthful weight.**

**Portion Control**

Moderation is one of the foundations of a healthy diet, and portion control will help you enjoy the foods you love in healthier ways. Serving sizes are bigger than ever before in restaurants, and many people do not know the proper portion sizes for foods. For example, one serving of pasta is about half of a cup cooked, but the serving sizes at restaurants are often many times that amount. To control portion sizes and get the right amount of nutrients each meal, divide your plate mentally into quarters. One quarter of the plate should be complex carbohydrates, like pasta or potatoes. One quarter should be meat or another protein and the rest should be devoted to vegetables. (Poppy Carpenter; December 07, 2018).

**Fruits and Vegetables**

Fruits and vegetables are loaded with vitamins, antioxidants, fiber and minerals but contain few calories. Making fruits and veggies part of your regular diet can reduce the risk of developing certain chronic diseases, like cancer, and provides your body with nutrients that are essential for good health. Plant foods are also filling because of their high fiber content, so they stave off hunger and reduce the temptation to binge eat later. (Poppy Carpenter; December 07, 2018).

**Whole Grains**

Whole grains, like oatmeal, brown rice and pasta, whole-wheat flour, whole cornmeal and bulgur, can lower your risk of developing cardiovascular disease, including stroke and heart disease. Making whole grains a part of your diet can also reduce the risk of developing asthma, gum disease, tooth loss, high blood pressure, colorectal cancer and inflammatory disease. (Poppy Carpenter; December 07, 2018),

**Limiting Unhealthy Fat**

While fat is essential to a healthy diet, certain types of fat should be avoided. Saturated fats, for example, come from animal sources, raise blood cholesterol levels and increase the risk of developing Type 2 diabetes and cardiovascular disease. Trans fats should also be avoided for the same reasons. Healthier fats that should be consumed in moderation include monounsaturated fat and polyunsaturated fat. Sources include nuts, seeds, fish, olive oil and avocado. (Poppy Carpenter; December 07, 2018).

**Limiting Processed Foods**

Sodium contributes to high blood pressure, which increases the risk of developing stroke or coronary heart disease. Up to three-quarters of the salt in an average American's diet comes from processed foods. Salt is used as an additive to change the color or texture of foods and is often used as a preservative or flavor modifier. Many processed products, like canned soups, breads, pastas, salad dressings, snacks and cereals, contain high levels of sodium. Avoiding these foods can help limit the sodium in your diet and reduce the risk of developing cardiovascular disease. (Poppy Carpenter; December 07, 2018)

1. **Can you increase your basal metabolic rate? Is it wise to try? Defend your answer.**

**How to Raise Your Basal Metabolic Rate**

While it would be nice to have the sort of metabolism that lets you eat whatever you want, whenever you want, without gaining a single ounce, most of us aren't that genetically lucky. Your basal metabolic rate, or BMR, is a measure of how many calories you'd burn if you just laid in bed all day, and it's determined in part by your genetics, which can't be changed. Some other factors influencing metabolic rate are somewhat in your control, so you can boost your BMR slightly. However, you'll get more results by just increasing your overall calorie burn by getting more activity. (Sylvie Tremblay, MSc, July 19, 2017).

**Factors Affecting Basal Metabolic Rate**

Genetics plays a large role in your basal metabolic rate. Some people are "energy-efficient"; they burn fewer calories at rest, which was beneficial when humans had to hunt and gather every calorie they needed to survive. But in today's society, in which most people have no trouble getting the calories they need, that slow, "efficient" metabolism just makes you more likely to gain weight. Gender also plays a role in metabolism, and men tend to have a higher BMR than women. (Sylvie Tremblay, MSc, July 19, 2017).

**Build Muscle Mass**

One of the most effective ways to raise your BMR is to increase your muscle mass. Muscle tissue is the most metabolically active tissue in your body, and the breakdown of old protein and synthesis of new protein in your muscles accounts for roughly one-fifth of your resting metabolic rate, writes Len Kravitz, Ph.D. for the University of New Mexico. That's significantly more than the metabolic rate of fat, which contributes an average of only 5 percent to your daily resting metabolism.

As a result, gaining muscle tissue helps you pack more metabolically active lean mass onto your frame, which will increase your calorie burn, even when you're resting. To do that, you'll need to get active with strength training. Include two or three strength training workouts that work every major muscle group in your body. As a bonus, strength training helps prevent or offset muscle loss as you age, so you'll keep you basal metabolism higher for longer. (Sylvie Tremblay, MSc, July 19, 2017).

**Eat Enough Calories**

While severely restricting your calorie intake might seem like a good way to shed pounds fast, it can negatively affect your metabolism. You naturally reduce your metabolism when you reduce your calorie intake to resist losing weight. This was a plus to our ancient ancestors when food was scarce, their metabolisms would slow down to avoid starvation but it also means that when you cut calories too much, you'll find it harder to lose weight due to a lower metabolism.

Avoid this semi-starvation state and the low basal metabolic rate that comes with it by keeping your calorie intake to at least 1,800 calories for men and at least 1,200 calories for women.

You will also get a slight metabolic boost by making certain food choices. Protein, for example, takes more energy to digest than carbohydrates or fat. As a result, higher-protein meals make you burn slightly more calories during digestion, which contributes to your overall calorie burn for the day. And opt for sources of carbohydrates that are high in fiber like beans, vegetables, fruits and whole grains. These fiber-rich carbs are harder to break down than refined cabs, like rice, so you'll burn slightly more calories during digestion. (Sylvie Tremblay, MSc, July 19, 2017).

**A Better Way to Boost Calorie Burn**

While basal metabolic rate does affect how easily you lose weight, it's more important to measure your active metabolic rate how many calories you actually burn during the day, taking into account your activity levels. When you're trying to lose weight, you'll want to eat 500 calories less than your active metabolic rate every day to lose one pound weekly; your basal metabolic rate doesn't directly factor into the equation.

The easiest way to increase your overall calorie burn is to get more activity. In addition to your strength training workouts, incorporate cardiovascular exercise like running, brisk walking or swimming into your routine. If you are already practicing cardio, improve your overall calorie burn by upping the intensity of your workouts or adding high-intensity interval training, short bursts of high intensity followed by low-intensity recovery. Not only do these training methods help you burn more calories during your workout, but you'll also increase post-exercise oxygen consumption, or EPOC, which increases your calorie burn for up to two days after your workout. (Sylvie Tremblay, MSc, July 19, 2017).

1. **Identify at least four societal factors that may have influenced the rise in obesity rates in the United States since 1963.**

In the United States, the percentage of children and adolescents affected by obesity has more than tripled since the 1970s. Data from 2015-2016 show that nearly 1 in 5 school age children and young people (6 to 19 years) in the United States has obesity. (CDC January 29, 2018).

Obesity is defined as having excess body fat. Body mass index (BMI) is a widely used screening tool for measuring obesity. BMI is a person’s weight in kilograms divided by the square of a person’s height in meters. Scientists have found that BMI is moderately related to direct measures of body fatness. Measuring height and weight is easier and less expensive than other methods for assessing weight status. (CDC January 29, 2018).

CDC recommends that health professionals use BMI percentile when measuring the bodies of children and young people aged 2 to 20 years. BMI percentile takes into account that young people are still growing and are growing at different rates depending on their age and sex. Health professionals use growth charts to determine whether a young person’s weight falls into a healthy range for his or her height, age, and sex. (CDC January 29, 2018).

CDC defines overweight in children and young people as a BMI at or above the 85th percentile and less than the 95th percentile for young people of the same age and sex.

CDC defines obesity in children and young people as BMI at or above the 95th percentile for young people of the same age and sex. (CDC January 29, 2018).

**Causes of Obesity**

Consuming more energy from foods and beverages than the body uses for healthy functioning, growth, and physical activity can lead to extra weight gain over time. The Dietary Guidelines for Americans encourage children and adolescents to maintain calorie balance to support normal growth and development without promoting excess weight gain. Energy imbalance is a key factor behind the high rates of obesity seen in the United States and globally. (CDC January 29, 2018).

**Many Societal factors contributing to obesity including:**

* Genetics
* Metabolism—how your body changes food and oxygen into energy it can use.
* Community and neighborhood design and safety.
* Short sleep duration.
* Eating and physical activity behaviors. (CDC January 29, 2018).

Genetic factors are difficult to change. However, people and places can play a role in helping children achieve and maintain a healthy weight. Families, communities, schools, out-of-school programs, medical care providers, faith-based institutions, government agencies, the media, food and beverage companies, and entertainment industries all influence the dietary and physical activity behaviors of children and adolescents. (CDC January 29, 2018).

Changes in the environments where young people spend their time—like homes, schools, and community settings—can make it easier to achieve and maintain a healthy weight. Schools can adopt policies and practices that help young people eat more fruits and vegetables, get at least 60 minutes of physical activity daily, and eat fewer foods and beverages that are high in added sugars or solid fats. (CDC January 29, 2018).

1. **Your friend Misty joins you for lunch and confesses that she is discouraged about her weight. She says that she has been trying “really hard” for 3 months to lose weight but that no matter what she does, she cannot drop below 148 lb. Based on her height, you know Misty is not overweight, and she exercises regularly. What questions would you suggest she think about? How would you advise her?**

**Conventional diets**

For most people, the problem is not one of severe obesity, but a more modest excess body weight. Even for people who have a serious problem of obesity, it is likely that less drastic measures than those discussed above will be beneficial. The aim is to reduce energy intake to below expenditure, and so ensure the utilization of adipose tissue reserves. To anyone who has not tried to lose weight, the answer would appear to be simply to eat less. Obviously it is not so simple. As shown in Figure 6.3, there is a considerable, and increasing, problem of obesity in Western countries – and a vast array of diets, slimming regimes, special foods and appetite suppressants is available.

The ideal approach to the problem of obesity and weight reduction would be to provide people with the information they need to choose an appropriate diet for themselves. This is not easy. It is not simply a matter of reducing energy intake, but of ensuring at the same time that intakes of protein, vitamins and minerals are adequate.

The preparation of balanced diets, especially when the total energy intake is to be reduced, is a highly skilled job, and is one of the main functions of the professional dietitian. Furthermore, there is the problem of long-term compliance with dietary restrictions – the diet must not only be low in energy and high in nutrients, it must also be attractive and pleasant to eat in appropriate amounts.

A simple way of helping people to select an appropriate diet for weight reduction is to offer three lists of foods:

• Energy-rich foods, which should be avoided. These are generally foods rich in fat and sugar but providing little in the way of vitamins and minerals. Such foods include oils and fats, fried foods, fatty cuts of meat, cakes, biscuits, etc. and alcoholic beverages. They should be eaten extremely sparingly, if at all.

• Foods which are relatively high in energy yield but also good sources of protein, vitamins and minerals. They should be eaten in moderate amounts.

• Foods which are generally rich sources of vitamins and minerals, high in starch and non-starch polysaccharide and low in fat and sugars (i.e. nutrient dense).

These can be eaten (within reason) as much as is wanted.

An alternative method is to provide people with a series of meal plans and menus, designed to be nutrient dense and energy low, and providing sufficient variety from day to day to ensure compliance.

To make this less rigid and prescriptive, it is easy to provide a list of foods with ‘exchange points’, permitting one food to be substituted for another. At its simplest, such a list would give portions of foods with approximately the same energy yield.

A more elaborate exchange list calculates ‘points’ for foods based on their energy yield, nutrient density and total or saturated fat content. The consumer is given a

target number of ‘points’ to be consumed each day, depending on gender, physical activity and the amount of weight to be lost, and can make up a diet to meet this target. An advantage of this is that foods that might be considered forbidden in a simple energy-counting diet can be permitted – but a single portion may constitute a whole day’s points.

An interesting variant of the exchange points system also allocates (negative) points to physical activity, so promoting physical activity as well as sound eating habits.

**Low-carbohydrate (ketogenic) diets**

At one time, there was a vogue for low-carbohydrate diets for weight reduction. These were soundly based on the fact that fat and protein are more slowly digested and absorbed than carbohydrates and therefore have greater satiety value. At the same time, a severe restriction of carbohydrate intake would limit the intake of other foods as well – one argument was that without bread there was nothing on which to spread butter.

There is certainly a benefit in reducing the intake of carbohydrates with a high glycaemic index, as these lead to a larger insulin response, and hence result in more triacylglycerol synthesis in response to insulin than an equivalent amount of carbohydrate with a low glycaemic index.

Nowadays a low-carbohydrate diet would not be recommended for weight reduction, as the aim for general health promotion is to reduce the proportion of energy from fat and increase that from starches. Furthermore, storage of dietary fat in adipose tissue is metabolically more efficient than synthesis of triacylglycerol from carbohydrate, so that dietary fat will contribute more to adipose tissue reserves than will an equivalent amount of dietary carbohydrate. Nevertheless, to those raised in the belief that carbohydrates are fattening (as is any food in excess) it is a strange concept that weight reduction is helped by increased starch consumption.

**High-fibre diets**

One of the persistent problems raised by many people who are restricting their food intake to lose excess weight is that they continually feel hungry. Quite apart from true physiological hunger, the lack of bulk in the gastrointestinal tract may well be a factor here. This problem can be alleviated by increasing the intake of dietary fibre or non-starch polysaccharide– increased amounts of whole-grain cereal products, fruits and vegetables. Such regimes are certainly successful, and again represent essentially a more extreme version of the general advice for a prudent diet.

It is generally desirable that the dietary sources of non-starch polysaccharides should be ordinary foods, rather than ‘supplements’. However, as an aid to weight reduction, a number of preparations of dietary fibre are available. Some of these are more or less ordinary foods, but

containing added fibre, which gives texture to the food, and increases the feeling of fullness and satiety. Some of the special slimmers’ soups, biscuits, etc. are of this type. They are formulated to provide about one-third of a day’s requirement of protein, vitamins and minerals, but with a low energy yield. They are supposed to be taken in place of one meal each day, and to aid satiety they contain carboxymethylcellulose or another non-digested polysaccharide.

An alternative approach is to take tablets or a suspension of non-starch polysaccharide before a meal. This again creates a feeling of fullness, and so reduces the amount of food that is eaten.

‘**Diets’ that probably won’t work**

Weight reduction depends on reducing the intake of metabolic fuels but ensuring that the intake of nutrients is adequate to meet requirements. Equally important is the problem of ensuring that the weight that has been lost is not replaced – in other words, eating patterns must be changed after weight has been lost, to allow for maintenance of a body weight with a well-balanced diet.

There is a bewildering array of different diet regimes on offer to help the overweight and obese to lose weight. Some of these are based on sound nutritional principles and provide about half the person’s energy requirement, together with adequate amounts of protein, vitamins and minerals. They permit a sustained weight loss of about 1–1.5 kg/week.

Other ‘diets’ are neither scientifically formulated nor based on sound nutritional principles, and indeed frequently depend on pseudo-scientific mumbo-jumbo to attempt to give them some validity. They frequently make exaggerated claims for the amount of weight that can be lost, and rarely provide a balanced diet. Publication of

testimonials from ‘satisfied clients’ cannot be considered to be evidence of efficacy, and publication in a book that is a best-seller, or in a magazine with wide circulation, cannot correct the underlying flaws in many of these ‘diets’.

Some of the more outlandish diet regimes depend on such nonsensical principles as eating protein and carbohydrates at different meals (so-called food combining) – ignoring the fact that such ‘carbohydrate’ foods as bread and potatoes provide a significant amount of protein as well (see Figure 9.3). Others depend on a very limited range of foods. The most extreme have allowed the client to eat bananas, grapefruit or peanuts (or some other food) in unlimited amounts, but little else. Other diet regimes ascribe almost magical properties to certain fruits (e.g. mangoes and pineapples), again with a very limited range of other foods allowed.

The idea is that if someone is permitted to eat as much they wish of only a very limited range of foods, even desirable and much liked foods, they will end up eating very little, because even a favourite food soon palls if it is all that is permitted. In practice, these ‘diets’ do neither good nor harm. People get so bored that they give up before there can be any significant effect on body weight, or any adverse effects of a very unbalanced diet. This is all to the good – if people did stick to such diets for any length of time they might well encounter problems of protein, vitamin and mineral deficiency.

**Slimming patches**

Basal metabolic rate is controlled to a considerable extent by the thyroid hormone tri-iodothyronine, and iodine deficiency results in impaired synthesis of thyroid hormone, a low metabolic rateand hence ready weight gain. Pathological overactivity of the thyroid gland results

in increased synthesis and secretion of thyroid hormone, and an increased basal metabolic rate, with weight loss.

The synthesis of thyroid hormone is regulated, and in the absence of thyroid disease provision of additional iodine does not increase hormone secretion except in people who were iodine deficient. Nevertheless, there are people who market various iodine- rich preparations to aid weight loss. Foremost among these are the so-called slimming patches, which contain seaweed extract as a source of iodine which is supposed to be absorbed from a small patch applied to the skin. There is no evidence that such patches have any beneficial effect at all.

**Sugar substitutes**

The average consumption of sugar is higher than is considered desirable. There is a school of thought that blames the ready availability of sugar for much of the problem of overweight and obesity in Western countries. Simply omitting the sugar in tea and coffee would make a significant contribution to reduction of energy intake. A teaspoon of sugar is 5 g of carbohydrate, and thus provides 80 kJ. Two spoons of sugar in each of six cups of tea or coffee a day would thus account for some 960 kJ – almost 10% of the average person’s energy expenditure. Quite apart from this obvious sugar, there is a great deal of sugar in beverages – for example, a standard 330 mL can of lemonade provides 20 g of sugar (= 320 kJ).

Because many people like their tea and coffee sweetened, and to replace the sugar in lemonades etc., there is a range of sugar substitutes. These are synthetic chemicals that are very much sweeter than sugar but are not metabolized as metabolic fuels.

Even those that can be metabolized (for example aspartame, which is an amino acid derivative) are taken in such small amounts that they make no significant contribution to intake. All of these compounds have been extensively tested for safety, but as a result of concerns about possible hazards some are not permitted in some countries although they are widely used elsewhere.

1. **Can you name the different kinds of malnutrition and then describe the signs that might tell you that childhood malnutrition is a problem in your community?**

**Types of malnutrition**

Malnutrition is a group of conditions in children and adults generally related to poor quality or insufficient quantity of nutrient intake, absorption, or utilization.

There are two major types of malnutrition:

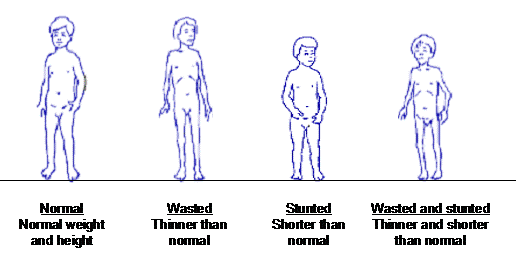
* Protein-energy malnutrition - resulting from deficiencies in any or all nutrients
* Micronutrient deficiency diseases - resulting from a deficiency of specific micronutrients

**Protein-energy malnutrition**

There are three types of protein-energy malnutrition in children:

|  |  |  |
| --- | --- | --- |
| **Type** | **Appearance** | **Cause** |
| Acute malnutrition | Wasting or thinness | Acute inadequate nutrition leading to rapid weight loss or failure to gain weight normally |
| Chronic malnutrition | Stunting or shortness | Inadequate nutrition over long period of time leading to failure of linear growth |
| Acute and chronic malnutrition | Underweight | A combination measure, therefore, it could occur as a result of wasting, stunting, or both |

**These forms of protein-energy malnutrition in children can be pictured like this:**



Wasting and stunting are very different forms of malnutrition. Stunting is chronic and its causative factors are poorly understood. Stunting usually does not pose an immediate threat to life and is relatively common in many populations in less-developed countries. This is not to say that it is unimportant, just less important than wasting in humanitarian emergencies. Wasting results from an acute shortage of food, is reversible with refeeding, and has a relatively high mortality rate. For these reasons, wasting is the highest priority form of malnutrition in humanitarian emergencies.

**Signs of malnutrition**

The most common symptom of undernutrition is unintentional weight loss (losing 5-10% or more of your body weight over three to six months).

Other signs can include:

* Weak muscles
* Feeling tired all the time
* Low mood
* An increase in illnesses or infections. (Olga Bornemisza….(et.al), 2009. The use of epidemiological tools in conflict-affected populations.

The main sign of overnutrition is being overweight or obese. However, people with undernutrition can also be overweight if they eat a diet high in energy (calories), but low in other nutrients.

Signs of malnutrition in children can include failure to grow at the expected rate and changes in behaviour, such as appearing unusually irritable, sluggish or anxious.

Your child’s weight and physical development should be regularly assessed by your GP when your child is young. Speak to your GP or health visitor if you have any concerns about your child’s health or development. (NHS 07 May 2018)

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