

**Course Name: Adolescent Health and Well-being: A Holistic Approach**

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**Week: 01**

**Lecture:02**

Lecture 02 - Introduction to Nutrition & Dietetics.

Hello everyone.

Let us start today's session that will be on Introduction to Nutrition and Dietetics. In this lecture we will cover lots of things that will be the basics of Nutrition. Those are various terminologies related to nutrition, physiology of food intake and different signals of satiety, determinants of food habit and dietary reference intakes. Now, here are few keywords that you will find those are nutrition, diet, dietetics, food habit, dietary reference intake.

Let us start with the concept of nutrition from where this word has been derived. This has been derived from 'nutritio', it is an Latin word and the meaning of this word is nourishment. If you think of the definition of nutrition you can tell that it is a process of providing or obtaining food required for health and growth. Whatever may be the definition, but the nutrition or nutritional requirement is varied in different individual because the need of the individual is different. And this nutrition that intakes that includes the food intake absorption, assimilation, catabolism, biosynthesis and excretion. If you see the outcome of nutrition you will get growth, development, maintenance of all the system inside the body, reproduction, health and disease.

Now, comes the food components, what is the meaning of this? Actually the food can be liquid and solid this we all know, but the nutrients are the components of the food that provide nourishment. And depending on the chemical nature, the nutrients or the food components that can be divided into 5 types carbohydrate, proteins, fats, minerals and vitamins. I think that I do not need to give the examples of carbohydrate, protein, fats because nowadays this topic 'Nutrition' is so popular and people have become aware of the fact that you need to eat more proteins, less fats and carbohydrate, but the minerals

and vitamins those are also very important for functioning proper functioning of the body. Minerals like iron, magnesium and the vitamins like vitamin A, vitamin E, D and we will discuss in details of these in our coming lectures.

In our day to day practice we usually use the term, macronutrient and micronutrient. So, what is macronutrient? As the name suggest, you can assume that macro means large. So, you will be needing these nutrient in a larger amount or you will take this nutrient in a larger amount and they will be the primary source of energy and building blocks of body. And the example of this macronutrient, these are carbohydrate proteins and fats, but what is micronutrient? Again the name suggests, that micro means minute. So, you will be needing these nutrients in a very small amount or very little amount, but it has a vital role in the proper functioning of the body. Their absence leads to a severe consequences and definitely that will be the different various types of diseases, and that includes the vitamins and minerals.

Another term nowadays is coming that is the functional food that is the whole fortified and enhanced food and provide the physiological health benefits beyond the provision of essential nutrients. But one important thing you should remember that you have to take this food on a regular basis. It contains the bioactive component that promote health and reduce the risk of chronic diseases and it does not differ in appearance from conventional foods and can be consumed as a part of regular diet. Example is like whole oat products that contain beta glucans and many of the studies has been proved that it reduces the total LDL cholesterol. Food additives is another term these are some chemical substances which are added to food to enhance its flavors, appearance, taste and other characteristics. And some of these food additives are preservatives. Example like aspartame which usually used as a sweetener and it is added to soft drinks and chewing gums. And calcium silicate is another example which is used as an anti caking substance which prevents the caking of baking powder and salt.

Now, the two term that is diet and dietary supplements both are very much close to each other and sometimes we use this term interchangeably. So, what is diet? Diet is a mixture of various foods in different proportions taken at a prescribed point of time. Then what is dietary supplements? It is the commercial products that contain the specific nutrients or their combination and these combinations will enhance the nutritive value of that food. Like the vitamins, minerals, fats and amino acids when we are adding to the major food or the base food, then it will become the dietary supplement. Another term that is dietetics, what is that? There is a practical application of scientific understanding of nutrition. It deals with the understanding of nutrients, dietary patterns, personal food choices, even the food habits and their effects on health. It involves an integration of some factors that those factors are biochemical, that may be physiological, that may be

social and the managerial. The integrations of all these things they will ultimately develop the nutritional practices which is required for a healthy lifestyle.

There is a complex physiological factors related to food intake. So, what is that? Whenever we are feeling hungry that time there is a signal come from our brain that you need to eat. And the sensation of the hunger that is triggered usually by sight, smell or thought of food. But whenever you are consuming the food the hunger is decreased and that results the satiety. And this satiety is the sensation that delays food intake and induces a feeling of fullness. There are certain centres in the brain that usually control this complex physiological process. One of them is the hypothalamus and it receives the various signals from our body and process them in as a result of that is the satiety. Now, the signals of satiety like whenever you are taking some food their receptors on the stomach that is the stretch receptor they are getting activated. And whenever they are getting activated that will tell your brain that do not eat more. There are certain hormones like gut hormones cholecystokinin, Ghrelin, peptide Y that are released in response of food intake. And that will also tell you that you are full. Certain protein hormones like leptin released from adipose tissues act on hypothalamus and that inhibit the food intake. Various studies that has been shown that if you are controlling your intake of blood sugar and amino acid levels and that can auto regulate the intake of carbohydrates and proteins. But these auto regulation is not true for fat metabolism. It is a complex process we can see here that various factors which are influencing the food intake. So, if first you can see at the top that there is a physiological need. So, first and foremost thing is definitely we eat because we want to get the energy because these energy is required for our day to day activity and also for proper functioning of different system in our body. So, there is hunger and satiety that already been discussed and the metabolism of the food depending on this food intake will be varied in different person.

Psychological influence is the another important thing because many of the people nowadays take food to get relaxed. And if someone is depressed, if someone is anxious that also can modulate one person's food intake. And also the type of food intake is dependent on the mood of the person. The junk food nowadays adolescents are taking much more. Not only the adolescents, but even the young people, the adults all are also very much habituated to get that junk food. Whenever you are taking that junk food there is a release of some hormones, those are called happy hormones like serotonin, dopamine and that will control your mood and you will feel sudden happiness. So, people are more attracted to junk food nowadays. We will discuss in details about junk food, what are the effects and how it will affect your later life, how it will affect your day to day activities.

The sensory appeal of food also influence your food intake. If the palatability of the food is more, definitely we will take that food more. Some social influences are there as the young people, the children, the adolescents' food habit or their food intake is many of

the time influenced by their family or the peer groups. Nowadays in a family both the parents were working, they are very much concentrated on their daily professional activities rather than what food they are giving to their children. So, many of the time they prefer the ready to eat foods or the junk foods. Those are high in calories, but less in nutritive values. And many of the time, peer pressure is more in case of adolescents whenever the adolescents they are going to the college and they are taking food, the other persons surrounding them are taking the junk food. So, even if he or she is carrying the fruits in his tiffin box he or she is not opening that thing he is taking that junk food along with their friends. And another thing is the food habits of an individual that influences the food intake. One is the social norms that already been told and your family norms or the surrounding people.

Next is the timing. Every time whenever you will go to the nutritionist or you will take help that how will you eat, what will you eat from some health professionals that time they always tell you take the small frequent meals. But nowadays the work pressure is so much and the children or adolescents are there in a competitive environment. So, many of the time they skip meals. If you skip meals, then definitely the next time when you will think that I need to eat you will take food whatever near to you. You will not think that I have to buy the fruits or I have to buy the rice and sabji and then will take whatever you will get that is cookies, cakes, biscuits or whatever you will be getting in your nearby shop. So, all these factors ultimately influence the food intake of a person.

Let us have an idea of meal structure. So, whenever we are taking a proper meal a lunch or dinner that time you should concentrate on three things. These three things are first of all is the core food, second is the secondary foods and finally, the peripheral foods. Let us have an idea of core food. Core food is actually the base of the meal and many of the time it is called the staple food and this the meal is structured on the basis of this core food. Like the people of West Bengal, they eat rice in both the occasions like in lunch or dinner. So, it is a staple food. So, this rice is the example of core food.

Now, the secondary food those foods which are taken along with the core food with specific properties like they will help to promote the strength, they will help in preservation of health and also provide extra nutrients. If you see the example it will be easier for you to understand like we take fish, meat and vegetables along with rice. So, we need to take meats if we want to take more protein, that protein will help the formation of the muscles and the vegetables they that will provide you fibers and different vitamins and minerals. Now, comes the peripheral foods and these are again called the non-essential foods. These non-essential foods are eaten occasionally. They do not form the part of the regular meal like sweets or cakes and in many of the custom sweets are such a thing that they can eat in every meal. Specifically the people of the

West Bengal they use sweets as a dessert and even sometimes they can take sweets alone. These are basically the peripheral or non-essential foods.

We do not have the idea that which type of food you will take more or we do not have the idea that what you will take more that will help to become a healthy person. You will get your proper energy, you will get your proper nutrients in your food, but not the extra calories. If you take the extra calories, then there will be obesity or overweight and if the person is getting overweight or obese during the adolescent time then definitely that will affect his adulthood.

Now, here are certain components of food habit of a person. You see that a person's food habit is actually the food preferences and these food preferences is different for different individuals and sometimes we can see these difference is within a family also. The family members have different food choices and there are certain food components of this food habit like the timing of the meal. I have discussed that the if you are taking your meal at proper time like the breakfast at 8 o'clock then lunch at 1 and then again snacks at 5 and dinner at 8 then you will not feel too hungry in between the meals and if you are not too hungry then definitely you will not feel that whatever is there in your surrounding or whatever is available surrounding me easily I should take that thing. That's why, timing of the meals is important thing. Another thing is the cost of the meal. Cost of the meal is another factor; some junk foods are costlier still people are taking it. Sometimes few junk foods are not that costly like the biscuits. if you think of that you want to have apple, the one apple is more than the cost of one biscuit. If the socioeconomic status of a person is in the middle class or lower class, they will prefer to have that biscuits rather than taking the fruits and vegetables, but people usually forget that the consequences of these a biscuit or the low cost junk food which are very bad. I will show you that how it will affect your later life. Now, the size of the meal or the portion of the meal. People have very less concept that what amount of carbohydrate you will take or what amount of protein you will take. We will discuss these things in our coming lectures. Methods of food preparation, food choice, how the foods are eaten if the person is staying alone and their food choices are different if the person is staying in a hostel or if the person is staying with their family. So, the people with whom you are taking the food that also controls your food habit.

Two major determinants of food choices are the food availability and accessibility. So, some of the people who are staying in the metro cities many of the time they are not getting the fresh vegetables and they are habituated then definitely they will have been habituated with the packaged food, but they do not think that if we go for 10 kilometers to 15 kilometers away then we get the fresh vegetables and that will affect our health and definitely that will be healthy for our body. Afterwards I will not acquire the disease like hypertension and diabetes, usually people forget that thing. So, these are certain things or

certain issues or certain points you should remember whenever you will choose your food.

Now, there is a concept of dietary reference intake. So, sometimes it is coming in our mind that what amount we will take or what amount of nutrients we will take. So, that our body will be healthy or you will be healthy in your adult life that means you will not acquire few of the lifestyle diseases. So, there are certain amount of a particular nutrient that a person must consume and this is decided according to various guidelines and references and recommendations. And these recommendations all together is called that dietary reference intakes. So, these are the set of quantitative estimates of specific nutrients of each category.

If you see that the dietary reference intakes that includes the estimated average requirement, the recommended dietary allowance, adequate intake and tolerable upper intake level. Let us have a look what are those? First we will see that recommended dietary allowance. This is actually the average daily dietary intake level that is sufficient to meet the nutrient requirement of nearly all. Nearly all that does not mean that 100 percent. Here the RDA is for 97 to 98 percent of the healthy individual, but this is based on particular life stage and gender group. So, what is the intention of this recommended dietary allowance? It is used as a goal for daily intake by individuals. So, you will understand that how much nutrient will be taken by and healthy adults or adolescents or children. RDA is different for different age group that is already mentioned in the definition. So, how can you calculate this recommended dietary allowance? That is based on estimated average requirements. And if you are not getting the data of estimated average requirements, then you cannot calculate this recommended dietary allowance. So, the formula is given here that recommended dietary allowance is the estimated average requirements plus 2SD that is the when you can calculate the standard deviation. But if you cannot calculate the standard deviation, then you can calculate that by the formula, RDA is equal to 1.2 into Estimated Average Requirements. Now, what is that estimated average requirements that is very much essential to calculate that RDA? So, it is the daily intake value that is estimated to meet the requirement of half of the healthy individual in a life stage or gender group. At this level of intake half of the specified group will not have its nutritional needs made.

What is the Adequate Intake? That is based on experimentally derived intake level and approximation of the observed mean nutrient intake by a group of healthy people. But whenever you are not getting the data or whenever your data is not sufficient to determine the Estimated Average Requirement, then you have to use the adequate intake. The similarities you can see that adequate intake or RDA both can be used as a goal for individual intake. And both are dependent on the specific life stage group, but the difference here you can see that RDAs are getting calculated, but the adequate intake that

is based on your observation or experiments. So, whenever you will be using this adequate intake you have to take the extra care.

Now, the tolerable upper limit that is the highest level of daily nutrient intake and is posed no adverse effects in almost all the individual. Nowadays these tolerable upper intake level is required for the estimation of this acceptable upper level, because nowadays the scope of fortification of the foods and nutrients has been increased and also we are using lots of dietary supplements. So, here is the graph where you can see that when you are taking the nutrients or when you are increasing your intake of nutrients and what is the risk of inadequacy. You can see that in case of estimated average intake the 50 percent of the people we get the adequate nutrient and 50 percent will not. In case of RDA 98 percent people will get the adequate nutrients, but 2 to 3 percent will not whereas, in case of tolerable upper level here the risk of inadequacy is 0, but when you are going beyond this level the adverse effect will occur.

Now, why these dietary reference intakes are used? They are used by different nutritional professionals and also by the governments to develop the nutritional levels, develop the dietary guidelines and food guides, ensure foods and supplement contain safe level of the nutrients, creating patient and consumer counseling and education programs and also it is helpful to assess the nutrient intake and monitoring of the nutritional status of the population.

These are my references.

We can conclude the session with the thought that nutrition involves consumption of food required for individual health and growth. Dietary needs are controlled by hunger and satiety which forms a complex physiological process. Individual food habit is influenced by various factors. Dietary reference intakes are the reference terms and it is the generic term for a set of nutrients and it is used for reference values.

Thank you.