

NUTRITION DURING ADOLESCENCE



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The Unity

Title	NUTRITION DURING ADOLESCENCE
Area	Healthy nutrition
Main Target Audience	<p>The end users of the module are:</p> <ul style="list-style-type: none"> ➤ Students of the participant institutions ➤ Trainers in the partner' institutions ➤ Consumers' associations ➤ Adult training centers ➤ Parents of minors and pregnant women
Description of the module and general aims	<p>This module allows the participant to understand:</p> <ul style="list-style-type: none"> - Development in adolescence - Changes in the body during adolescence - The nutritional needs of adolescents - Factors that influence the dietary behavior of adolescents - Problems related to nutrition and body image - Nutrition advice in special situations
Learning Time and Duration	<p>Learning time and maximum duration for the training related to the module:</p> <p>The maximum duration of training is 24 hours</p> <p>24 hours theoretical training</p>
Learning Objectives	<p>Specific learning goals, i.e. what is going to be trained and will be learnt by the target after a successful completion of this module.</p> <p>Once you have completed this course you will be able to:</p> <ul style="list-style-type: none"> - Understand the changes of the body during adolescence - Understand the psychological and social changes during this age - Get acquainted with the special nutritional needs of adolescents - Understand how obesity can be avoided - Know about the necessity of physical activity
Competences achieved	<p>Specific competences related to the project theme:</p> <ul style="list-style-type: none"> - Organize one's daily and weekly diet patterns - Change one's diet during examinations - Avoid obesity - What to eat when out of home
Pedagogical methods used (selfstudy, group work, distance learning, etc.)	<p>Type of activities considered useful for the training of this module:</p> <ul style="list-style-type: none"> - Face to face teaching - Online learning - Suggestion of additional websources and bibliograpfy

1. Abstract

This unit is structured into two main sections: (1) Development in adolescence and (2) dietary behavior of adolescents.

In the first section presents the basic knowledge of nutritional needs of adolescents. It gives several tips for healthy diet. The second section consists on factors that influence the dietary behavior of adolescents and problems related to nutrition and body image.

Key words: adolescence, body composition, nutritional needs, energy requirements, nutrient requirements, balanced diet, weight loss, obesity, eating disorders, physical activity

2. Introduction

Adolescence is the period of human life that begins with puberty and reaches adulthood, where the development of the organism is completed. During this period, both physical and mental development is rapid, resulting in increased nutritional needs in more nutrients. As the teen gradually becomes autonomous, his dietary habits change, including increased consumption of food away from home, consumption of snacks high in fat or sugar, fewer family meals, while it can also be observed increased appetite. Also, due to the intense school program, physical activity of adolescents usually declines. So, we come to realize the importance of adopting proper dietary habits in order to cover the increased demands and to achieve a healthy weight as well.

Adolescents grow at different rates and it is difficult sometimes to accept the changes in their body while they may develop unrealistic expectations about how their body should look. As a result, they may get or lose weight, become overweight or underweight. Both obesity and preoccupation with diets for weight loss but also eating disorders constitute problems of adolescence related to nutrition. For the treatment of obesity is recommended the change of eating behaviors and also the increase of physical activity and at the same time the reduction of sedentary activities. The family involvement is equally important. On the other hand, eating disorders are considered psychiatric disorders and require the contribution of many specialties for their treatment (psychiatrist, psychologist, nutritionist, doctor).

Also, adolescents often experiment with new dietary regimens such as vegetarian diet while in this period are confronted with special situations, like the large *volume* of examinations for school. The following chapters provide recommendations for balanced diet for adolescents but also recommendations regarding the above special situations.

Section I

3. Core contents

3.1. Development in adolescence

3.1.1. Changes in weight and height

During adolescence, the growth is rapid. In this period, adolescents get 20% of the height that they will have as adults and 50% of the weight, while most of their organs are doubled in size. While before adolescence, boys and girls have the same body size, from the beginning of puberty growth rates are not the same for both genders. Girls reach the maximum growth rate 2 years earlier, in 10 or 11 years while boys at 12 or 13. Thus, while in the early years of the adolescence the girl is about 4-5 cm taller than the boy of the same age, towards the end of adolescence the boy ends up being 10 to 12 or more cm taller. While in boys the growth rates of weight and height coincide, in girls growth rate of height precede/*comes before* by about 6 months of the rate of weight gain. It is important to note that the growth rate can vary significantly from person to person, even of the same gender.



3.1.2. Changes in body composition

During the adolescent period, another physiological change that occurs and varies with gender is body composition. Girls gain more fat while boys almost double their muscular tissue. Due to the deposition of fat in girl's body, changes are observed also in body shape since deposition is made at certain points, especially on the buttocks and chest.

3.1.3. Changes in bone development

Adolescence is also characterized by a rapid skeletal development, during which is obtained about 40% of the total mass of bone (bone mass). The skeleton grows and the dimensions of the bones change. Especially *visible* are the changes in the shoulders and pelvis, which are different for the two genders. In boys, the region of the shoulders increases more than the pelvic region while in girls the opposite happens. The bone development and health in adolescence are influenced by genetic, hormonal, mechanical

(physical activity) and dietary factors. Therefore, the role of balanced nutrition is important also for bone health and for the obtainment of high bone mass during adolescence, which protects from the appearance of osteoporosis after menopause.

3.1.4. Psychological and social changes

Adolescence is a period of maturation for both the body and the mind. Along with physical growth and changes that occur in the body, the adolescent grows mentally, emotionally and socially. During adolescence, the adolescent begins to know his body, trying at the same time to make it attractive for peers of the opposite sex. He often feels embarrassment and anxiety watching the changes in his body, which he thinks that the others around him observe, like various skin problems (acne) or changes in weight and body shape. Also, during this phase, the teenager:

- Develops and stabilizes his body image, which is necessary for the development of the self image and the formation of his individual identity.
- Changes radically his way of thinking. He thinks methodically, develops skills on decision making and problem solving.
- Begins to become autonomous.
- Is often influenced by his peers.
- In the early years of adolescence he trusts adults (eg parents) while later he questions them and is less influenced by them.
- Has frequent emotional changes or changes concerning his interests.
- Forms emotional relationships outside the family.
- Makes plans for the future, sets goals and objectives and formulates values and beliefs.

The above changes usually affect also the dietary habits of adolescents. For example, in their effort to become autonomous, adolescents often experiment with weight loss diets or vegetarian diets (exclusion of food of animal origin).

3.2. The nutritional needs of adolescents

3.2.1. Energy requirements

As a result of significant increases in weight, height, muscle and adipose tissue and of organs development during adolescence, energy needs increase as well. The energy needs, measured in calories, vary greatly from person to person because of different growth rate and different levels of physical activity among adolescents. Also, they are higher in boys than in girls. In the table below are presented the energy requirements in calories per gender and age, and according to the level of physical activity:

Energy requirements in calories (kcal) by gender and age, and according to the level of physical activity				
Level of physical activity**				
Gender	Age* (years)	Low	Moderate	Intense
Girls	9-13	1400-1600	1600-2000	1800-2200
	14-18	1800	2000	2400
Boys	9-13	1600-2000	1800-2200	2000-2600
	14-18	2000-2400	2400-2800	2800-3200

* In children and adolescents, more calories are needed as age increases.

**Low means lifestyle that includes low physical activity associated with the typical daily activities. Moderate means physical activity equivalent to walking about 2,5-5 km / day, and intense to walking > 5 km / day.

Source: Institute of Medicine. Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids. Washington (DC): The National Academies Press; 2002.

3.2.1. Nutrient requirements

For most nutrients (carbohydrates, lipids, proteins, vitamins, minerals), adolescents needs are similar to those of adults, with the exception of protein, iron and calcium, which are listed below. The role and importance of nutrients are presented in detail in the 1st section "*An introduction to healthy diet.*" The table below shows the change in nutrient requirements according to age. Percentages refer to the proportion of total daily energy intake (calories we ingest in a day):

Recommended proportions of nutrients according to age			
	Carbohydrates	Proteins	Lipids
Young children (1-3 years)	45-65%	5-20%	30-40%
Older children and adolescents (4-18 years)	45-65%	10-30%	25-35%
Adults (≥19 years)	45-65%	10-35%	20-35%

Source: Institute of Medicine. Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids. Washington (DC): The National Academies Press; 2002.



- **Cereals**

Often referred to as starchy foods (they contain a large quantity of starch). In this group belong all foods derived from cereals (eg wheat, barley, oats, rye, oatmeal) like bread, nuts, pasta, rice, breakfast cereals as well as potatoes and corn (starchy vegetable). Cereals are mainly a good source of carbohydrates, which are the main nutrient for energy supply. They also contain fiber, B vitamins as well as minerals (eg magnesium). They are divided in wholegrain (whole grain milling) and refined or peeled cereals (without grinding the husk and germ of the grain). The wholegrain have more health benefits (eg intestine's health) and it is good to be preferred. They form the basis of our diet as it is recommended to be consumed in larger quantities than other food groups.

- **Fruits**

In this group belong all forms of fruit, that is fresh fruits, boiled or baked or dried fruits and natural juices, but it is better to eat the fresh fruits. The fruits are a rich source of vitamins (such as A, C, folic acid), fiber (they contribute to proper intestine function) and minerals (such as potassium). They have high water content and contain relatively few calories.

- **Vegetables**

In this group belong all vegetables in any form, fresh, boiled, baked, frozen, in the form of salad or as a main dish (eg food in olive oil). Vegetables are rich in vitamins, fiber, minerals and antioxidants. They are further divided into five subgroups according to their color, like fruit. Each color has specific characteristics so in order to get everything we need to consume fruits and vegetables of all colors (red, green, yellow, orange and purple).

- **Meat and its products, fish, eggs, legumes**

This group is often called and "protein" group because of the high content in protein of the foods of the group. In this group belong: meat, poultry, fish, seafood, eggs, legumes. The main nutrient of the group is the high quality proteins (of high biological value) but they also contain vitamins (eg, folic acid, vitamin B12) and minerals (eg iron, zinc.) Because not all of the foods of this group have the same value, it is recommended different frequency of consumption. Specifically it is recommended the reduction of the consumption of red meat (eg beef, pork, lamb) and its products (cold cuts) and increase of the consumption of fish and seafood. For people who follow vegetarian diet or who avoid meat, legumes are a very good choice.

- **Dairy**

In this group belong milk and dairy products, namely cheese and yogurt as well as

desserts based on milk, such as frozen yogurt. The main feature of the group is calcium but they also constitute good sources of protein, phosphorus, potassium and vitamin D. They contribute to the development of bones and teeth but they have also other health benefits. For people who want to regulate their weight, the low fat dairy is a good choice.

- **Fats and oils**

In this group belong foods which consist mainly of fat. That is all the oils such as olive oil or other seed oils (eg corn oil), margarine, butter, mayonnaise and sauce based on mayonnaise, olives, nuts and bacon. As in other food groups, all foods in this group are not of the same quality. Vegetable oils and especially olive oil, which is the main characteristic of the Mediterranean diet, are more beneficial for health, containing antioxidants, vitamin E and "good" lipids (monounsaturated, omega-3, omega-6). Because these foods are rich in calories, it is recommended their consumption in moderation.

- **Foods high in sugar or fat**

In this group belong mainly some sweets and snacks such as biscuits, croissants, cakes, pastries, chips, crisps, refreshments or juices with sugar. These foods are low in nutrients and their consumption is not considered as essential. They have good taste and are usually consumed as delicacies and treats, so we like to have them in our diet. If we consume them in moderation (not everyday, small quantities), we can include them in our diet, as long as we do not replace foods from other groups which are necessary.

The following table, presents the indicative quantities recommended from each food group for boys and girls, according to the U.S. Department of Agriculture (USDA):

Recommended servings for each food group per day by gender and age in adolescents						
Gender	Age(years)	Cereals	Fruits	Vegetables	Meat	Dairy
Girls	9-13	5 servings ¹	1 ½ cup ²	2 cup ³	5servings ⁴	3 cup ⁵
	14-18	6 servings ¹	1 ½ cup ²	2 ½ cup ³	5servings ⁴	3 cup ⁵
Boys	9-13	6 servings ¹	1 ½ cup ²	2 ½ cup ³	5 servings ⁴	3 cup ⁵
	14-18	8 servings ¹	2 cup ²	3 cup ³	6 ½ servings ⁴	3 cup ⁵

Explanation of servings

¹1 serving of *cereals* = 1 slice of bread (30 g.) = ½ cup. boiled rice or pasta = one cup. of breakfast cereals

²1 cup of fruit = 1 cup. fresh fruit or fresh juice = ½ cup. dried fruits

³1 cup of vegetables= 1 cup fresh or cooked vegetables or vegetable juice = 2 cups. green leafy vegetables

⁴1 serving of protein = 30 g. meat / fish = 1 egg = ¼ cup. boiled legumes = 15g. nuts / seeds

⁵1 serving of dairy = 1 cup of milk = 1 xxx of yogurt = 45 g. yellow or mozzarella cheese = 1 cup of frozen yogurt or ice cream

* With the term "cup" we mean the cup of tea (240 ml)

Section II

4. Put into practice

4.1. Factors that influence the dietary behavior of adolescents

The adolescent is at a stage of his life, where he tries to take his own decisions about his nutrition , indicating this way his autonomy towards the family and society. The food choices of adolescents are a function of many factors such as gender, family environment, social standards, the characteristics of the foods, the place of consumption and are often associated with their body weight. They may also play a role in the determination of their identity and we often see that for this reason, they avoid or accept food , they slim down or get fat.

Some of the factors that influence the food choices of adolescents are:

- the structure and characteristics of the family and mainly the dietary habits of parents,
- advertising,
- social and cultural values as well as the body standards ,that the industry promotes,
- the body image,
- the psychosocial development,
- personal experiences (eg, what they have tried)
- the taste and appearance of foods,
- the convenience of preparation or availability of foods.

4.2. Problems related to nutrition and body image

4.2.1. Obesity

Obesity in children and adolescents has become a global epidemic and a serious problem for public health. According to the World Health Organization (WHO), obesity is defined as the excessive accumulation of body fat, to an extent that will affect the health of the individual. Estimations of the IOTF (International Obesity Task Force) for the World Health Organization in 2005, show that 1 in 5 children in Europe are overweight while Greece has one of the highest rates of obesity and overweight in children and adolescents in Europe.

Adolescence is one of the most critical periods for the development of obesity together with fetal age and age of 4-6 years.

4.2.1.a Factors that cause the development of obesity

The regulation of body weight depends on many factors: genetic, environmental, social, psychological. The *genes* the parents inherit to their children determine largely their weight. . Also, the *family*, which influences the eating habits of its members and the availability of food at home. However, *dietary habits and physical activity* will finally determine the weight of the teenager. The intake of more calories than the ones consumed leads to fat accumulation and to body weight gain. The abundance of food and the ease of its gain in modern societies in combination with reduced physical activity are important factors predisposing *to* increased body weight. The following behaviors seem to contribute to weight gain in adolescents:

- Overconsumption of food. The quantity and quality of food can influence how much we eat. Generally, large portions and frequent consumption of energy "dense" food (high in fat or/and sugar) lead to overconsumption.
- Omission of breakfast
- Food away from home
- Over-consumption of refreshments, processed juices or other beverages with added sugar
- Low frequency of family meals
- Reduced physical activity. Due to the increased number of school obligations quite few adolescents stop or reduce their athletic activities.
- Time of involvement with screens (TV, PC, video games). It seems to affect in two ways: it reduces physical activity and increases food consumption (mainly snacking, snacks).

4.2.1.b Impacts of obesity in adolescence

Adolescent obesity increases the likelihood of adult obesity and consequently the risk of various diseases such as cardiovascular diseases and diabetes mellitus. Apart from the health problems in adulthood, adolescent obesity can cause problems and to adolescents, both physically affecting most body systems (orthopedic, respiratory, cardiovascular, diabetes mellitus, early puberty, etc.) and psychosocial (eg isolation-less friends, low self-esteem, eating disorders).

4.2.1.c Assessment of obesity

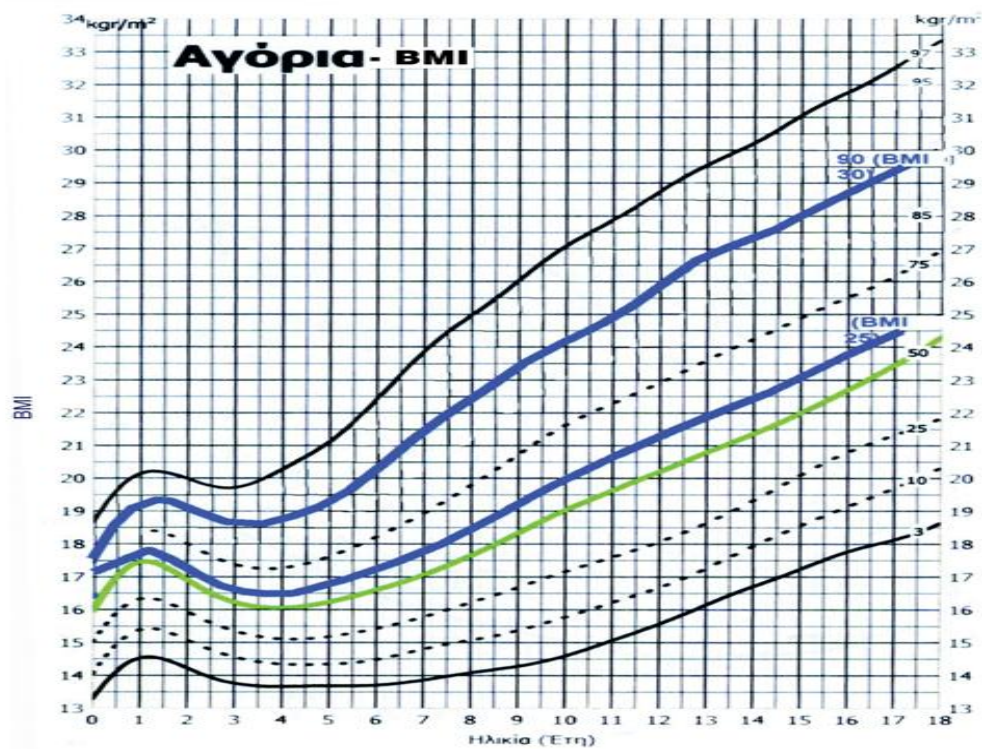
To evaluate the weight of children and adolescents we usually use the growth curves (Figure 1) for Body Mass Index (BMI). On these curves, which are different by gender, is illustrated BMI and age. BMI shows the relationship between weight and height and is calculated as follows:

BMI = Weight (in kilograms, kg)

Height x Height (in meters, m)

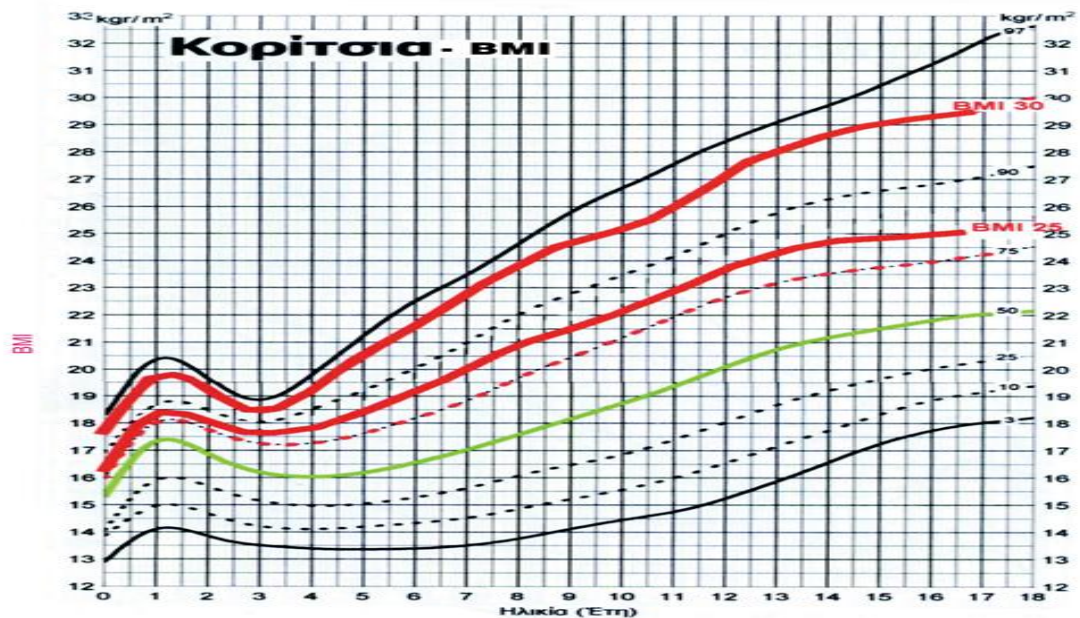
For each age, BMI values that lie between the two blue (boys) or red (girls) lines correspond to the "overweight" (more weight than the healthy) and the values which are above the highest blue or red line correspond to "obesity" (much more weight than the healthy).

Figure 1. Growth curves for BMI by gender and age



ΕΚΑΤΟΣΤΙΑΙΕΣ ΘΕΣΕΙΣ (ΕΘ) BMI ΣΤΙΣ ΔΙΑΦΟΡΕΣ ΗΛΙΚΙΕΣ. ΜΕ ΕΝΤΟΝΗ ΔΙΑΓΡΑΜΜΙΣΗ ΠΑΡΙΣΤΑΝΤΑΙ ΟΙ ΕΘ ΠΟΥ ΔΙΑΤΕΜΝΟΥΝ ΤΙΣ ΤΙΜΕΣ BMI 25 ΚΑΙ 30 ΑΝΤΙΣΤΟΙΧΑ ΣΤΗΝ ΗΛΙΚΙΑ ΤΩΝ 18 ΕΤΩΝ ΚΑΙ ΔΙΑΧΩΡΙΖΟΥΝ ΑΝΤΙΣΤΟΙΧΑ ΤΟ ΥΠΕΡΒΑΡΟ ΚΑΙ ΠΑΧΥΣΑΡΚΟ ΑΠΟ ΤΟ ΦΥΣΙΟΛΟΓΙΚΟ ΑΤΟΜΟ.

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ΕΚΑΤΟΣΤΙΑΙΕΣ ΘΕΣΕΙΣ (ΕΘ) BMI ΣΤΙΣ ΔΙΑΦΟΡΕΣ ΗΛΙΚΙΕΣ. ΜΕ ΕΝΤΟΝΗ ΔΙΑΓΡΑΜΜΙΣΗ ΠΑΡΙΣΤΑΝΤΑΙ ΟΙ ΕΘ ΠΟΥ ΔΙΑΤΕΜΝΟΥΝ ΤΙΣ ΤΙΜΕΣ BMI 25 ΚΑΙ 30 ΑΝΤΙΣΤΟΙΧΑ ΣΤΗΝ ΗΛΙΚΙΑ ΤΩΝ 18 ΕΤΩΝ ΚΑΙ ΔΙΑΧΩΡΙΖΟΥΝ ΑΝΤΙΣΤΟΙΧΑ ΤΟ ΥΠΕΡΒΑΡΟ ΚΑΙ ΠΑΧΥΣΑΡΚΟ ΑΠΟ ΤΟ ΦΥΣΙΟΛΟΓΙΚΟ ΑΤΟΜΟ.

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4.2.1.d Prevention and treatment of obesity- adolescents weight regulation

The need for prevention and treatment of obesity in adolescents is so great both because of the potential impact on health and of the increasing number of overweight and obese adolescents. The lifestyle changes by adopting balanced dietary habits and regular physical activity constitute the main principles for the prevention and treatment of adolescent obesity. In some cases of severe obesity in adolescents or inability of weight loss using these ways, surgical weight loss methods could be used or medications use always under the guidance of a doctor.

4.2.1.e When is recommended the weight loss?

Weight loss depends on how much increased the adolescent weight is, on possible coexisting health problems and as well on the age and stage of development of each adolescent.

- If the adolescent is overweight, it is recommended the weight maintenance or mild loss so that with increasing height his weight will normalize.

- When the child's weight is greatly increased (obesity) or/and when health problems coexist, then the weight loss is recommended, which can range from 0.5 to 4 kilos a month, depending on the seriousness of the situation, the stage of development etc.

4.2.1.f What can the adolescent change?

- **Diet**

- i. **Reduction of energy "dense" foods**

Adolescents often consume food outside the home (mainly fast food) and snacks from foods high in fat or sugar as packaged food (eg chips, crisps), pastries and refreshments. These foods are not banned but should be consumed in moderation and as part of a balanced diet.



ii. Serving size

The control the quantity of food is one of the most important factors in the regulation of body weight. Try to reduce slightly the quantity of food (not the salad). Also, in fast food restaurants is good to choose the smaller portions and the smaller packs in supermarkets as well.

iii. Consumption of breakfast

Eating breakfast is associated with better regulation of the body weight and better performance in school.

iv. Number of meals

By allocating food into small and regular meals, you avoid overeating that usually follows when 6 or more hours have passed from the last meal. You could eat 4-5 meals a day, 2-3 larger (main meals) and 1-2 smaller (snacks). This helps to meet the nutritional needs and to prevent snacking.

v. Complete meals

It is important for the health and proper development of the child, that the main meals (breakfast, lunch, dinner) are "complete". This means that they should contain foods from three basic food groups: starch (cereals), protein (meat, fish, eggs, dairy), and fruit / vegetables. Each of these groups contributes in its way to the proper functioning of the organism.

vi. Meals with the family

Family meals in a pleasant and quiet environment, are associated with better dietary habits and better weight control.

- **Physical activity**

i. Increase of physical activity

By various international organizations, it is recommended that the adolescent exercises at least one hour a day. This may include daily activities such as walking to and from school, walking with the dog, walking up and down the stairs, working in the garden, cycling, dancing and organized activities such as sports and recreational games. The involvement of parents in activities is important.



ii. Reduction of sedentary activities

Usually includes time the adolescent spends in activities in front of a "screen" such as TV, video games, computer, mobile phone. It is recommended the reduction of sedentary activities up to 2 hours a day and their replacement by kinetic activities.

4.2.1.g Advice for adolescents parents

The parents and the family in general, play a determinant role in the effort of changing dietary habits and increasing physical activity of adolescents by creating the suitable environment for their adoption. In the effort to manage their weight, adolescents need support and encouragement from their parents. As they are growing up, adolescents choose for themselves what they will consume at school and other places outside the home while they affect family food shopping.



Some indicative advice for parents follow:

- Aim for gradual change of the habits of the whole family concerning the diet and exercise.
- If the parents are overweight too, they should themselves control their body weight.
- Avoid to comment on adolescents weight or body image as well as the comparison with other family members or friends.
- Make sure they are available at home nutrient-rich foods such as fruits and vegetables, milk and yogurt.
- Avoid to have at home food rich in fat or sugar such as croissants, biscuits, sweets, chips.
- It is good to become a "*model*" for your children, keeping yourselves first the principles of proper diet and doing exercise.
- Avoid the pressure for any change , it may have the opposite effect.
- Reward every effort of the adolescent to change.
- Aim to consume at least one meal of the day the whole family together.

4.2.1.h Weight loss diets

While on the one hand, as mentioned above, there is abundance and overconsumption of foods, promoted in modern societies, on the other hand, it is also promoted as a model the slim body, particularly in women, affecting many teenage girls. The projection of this model through the fashion, the advertising and the media, puts pressure on teenage girls to keep up with these physical standards while they often feel dissatisfied with their bodies. As a result they try to lose the supposedly extra kilos resorting to weight loss diets, which usually are restrictive (quick fix diets) are based on the exclusion of certain foods from their diet and on improvisation, influenced by diet regimens advertised in magazines. On the contrary, the boys rarely diet.

Apart from social standards, engaging with diets may indicate a reaction of adolescents to various stress factors such as family discord or changing environment. In any case, the problem with these diets is that they usually are not rational, they are not compatible with the adoption of healthy dietary habits and can have serious health effects, preventing the normal development of the organism.

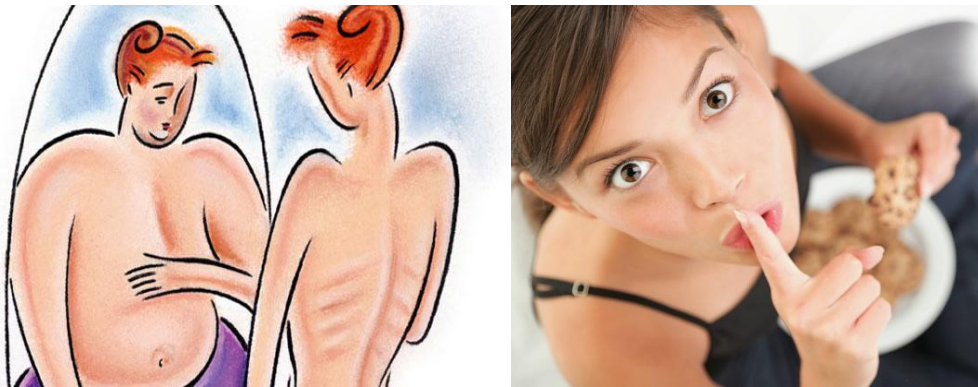


4.2.2. Eating disorders

The eating disorders are considered psychiatric disorders because they concern the behavior and not a disorder in the metabolism of food. The most common symptoms like the starvation, the binge eating disorder (continuous eating usually in secret) and bulimia are usually due to psychological and emotional difficulties. They concern almost exclusively teenage girls (or shortly after adolescence) and less often boys, except in some cases of boys who participate in sports which require a low body weight.

Eating disorders are classified into:

- **Anorexia nervosa:** central symptoms are weight loss and intense preoccupation with weight and body shape. These people fear that they are or will become fat even if they are thin, avoiding foods and gradually losing much weight (weight <85% of normal). In women it is usually observed amenorrhea (cessation of period).



- **Bulimia nervosa:** is characterized by recurrent episodes of binge eating, excessive preoccupation with the control of body weight, fear of weight gain which leads to paradoxical ways of reducing it (self induced vomiting, use of laxatives, anorectic drugs, diuretics). These people usually have normal weight and the women regular period.
- **Binge eating disorder:** is characterized by constant eating at a certain time and at a rate faster than normal and in secret (because of shame). Usually it does not concern adolescents but mainly women at older ages (45-55 years).

The eating disorders are a way of *seeing* life and the problems that the teenager boy or girl have and seem difficult and unresolved. Through the control of food, they feel that there is some area of their lives which they control. While they seem to be a "solution" in the beginning, gradually due to poor nutrition, complications are presented which can be serious for health like: a negative impact on growth, on brain development and on bone density, dehydration, abnormal menstruation (period), low self esteem, anxiety, stress, etc.

Their early diagnosis is critical both because of the destructive health effects and the problems caused *to* the family.

4.2.3. Nutrition advice in special situations

4.2.3.a Nutrition advice during the examination period

The exam period is a difficult and challenging period, when the organism has increased needs. Think of this period as a "spiritual" marathon, where endurance plays a great role. A proper and balanced diet can help you to have sufficient energy, better memory and also increased performance! On the other hand, the wrong dietary practice can make you feel weakness and nervousness.



i. Start your day with a good breakfast

It is the first meal of the day which will give you energy, will keep you alert and enhance your performance. Good breakfast choices are:

- Milk + cereals + natural fruit juice
- Milk + bread / rusks + fruit + honey
- Natural fruit juice + toast with cheese-turkey
- Natural fruit juice + boiled egg + bread + cheese + dried fruit

ii. Frequent and small meals

The distribution of meals throughout the day will provide you with the required energy throughout the entire time. The brain constantly needs "fuel" to function properly. It is best to avoid large (especially fatty) meals as they make difficult and slow down the digestive process and may make you feel sleepiness. You can eat breakfast, two main meals (lunch, dinner) and 2-3 smaller snacks during the day, without this number to be binding.

iii. Complete meals - food variety

It is good for the main meals to be complete, that is to contain foods from the three main groups: vegetables (salad / cooked) or fruit, protein (meat / fish / cheese / egg / legumes) and starchy foods (bread / rice / potatoes / spaghetti). It is better to have variety in fruits, vegetables, protein and starchy foods as this way you will get more vitamins, minerals and antioxidants, which are necessary for the proper functioning of the organism and the reduction of fatigue.

iv. Snacks-the small and precious meals

"Snacks", that is the in between small meals, will provide you with energy and vitamins. Good choices are:

- Fresh or dried fruit or fruit salad
- Natural fruit juice
- Yogurt with honey or oats

- 1-2 handfuls of nuts (walnuts, almonds, hazelnuts, sunflower seeds) without salt
- 1 small candy (eg 1 cup /trays of rice pudding, 1 small dark chocolate, 1 scoop of ice cream)
- Smoothies / milkshake with: milk, honey, fruits

v. 'Good' fat sources

There are fats that help the functioning of the organism and the brain, and which is necessary, known as omega-3 and omega-6 fatty acids. These are found in oily fish (salmon, sardines, anchovies) and also in nuts (walnuts, sunflower seeds, almonds, sesame seeds). Olive oil is also a good source of fatty acids and also antioxidants.

vi. Adequate hydration

Proper hydration helps to the invigoration and alertness of the organism and protects you from fatigue and loss of concentration. It is good to drink plenty of water, but also foods that contain enough water will help you, such as fruits, vegetables, juices and milk. It is good when reading or during the examination to have beside you, a bottle of water in order to remember to drink some regularly. If you wait until you feel thirsty to drink water, that means you are already dehydrated!

vii. Coffee

Coffee consumption (often *large* quantities) is common in examination periods. The alertness caused to the nervous system and the brain may keep you awake, but it does not help you relax and sleep sufficiently. Beware of excessive consumption because it can cause you additional tension.

viii. Sugar

It is true that sugar provides instant energy and food in the brain. However, the same function have the most carbohydrates (fruits, juices, honey, cereals, bread, etc.), which will offer you many other nutrients, which the sugar and sweets in general will not, such as vitamins, fiber and minerals.

On the other hand, the *moderate* consumption of chocolate or a small candy can improve your mood and help you to read.

ix. Supplements-superfoods

In recent years many food supplements circulate in the market. The truth is that if you follow a balanced diet, supplements are not necessary for you. However, often the diet of many adolescents (and adults) do not cover all the necessary ingredients. If you decide to use a dietary supplement, it is advisable to consult your doctor / pharmacist / nutritionist before. Some known supplements- superfoods circulating are spirulina, royal jelly, sea buckthorn and many multivitamin supplements, which reinforce the body's defenses, offer wellness, energy, many vitamins, minerals and trace elements.

x. Exercise- Rest

Low physical activity (eg walking, walk, bike, swim, dance) can refresh you, relax you and regenerate you of many consecutive hours of reading. Try anything you like and gives you pleasure that can defuse you.

Also, sufficient and calm sleep is essential to be refreshed and full of energy in order to recall everything you have studied the previous days but also assimilate the new information that follow.



xi. What to avoid during the examination period

- The **weight loss diets** or extreme dietary behaviors.
- The consumption of **alcohol**, which can cause you sleepiness, headache and fatigue.
- The **testing** for the first time of new foods, beverages or dietary supplements because you do not know how your organism will respond to them. Anything you want to try, you can do it before this period so as not to find yourself "surprised."
- The **"big" meals**. It is good to eat as much as you need to fill your stomach, but not as much to feel "bloated" as you may feel sleepiness and weakness since your body will spend more energy to the digestive process rather than the functions of the brain.
- The **omission of meals**. If you do not skip meals, you will constantly have "your batteries full." Many times, it is reasonable to forget absorbed by the study, so you can have at your side a small healthy snack (like see above) or take short breaks to rest and eat something.
- The **overconsumption of sweets or fast food** (often high in fat), assuming that will give you quick energy without losing time. It may be delicious but they are usually indigestible, very poor in nutrients and may affect body weight if the exam period is great.

It is good to remember that during this period your time is precious, so you need to have good planning not only in reading but also in your diet!

4.2.3.b Advice for eating away from home

Studies show that from the beginning of adolescence until the end the number of meals consumed by the adolescent outside the home increases, a fact that proves his need for autonomy and desire for free time away from home and family. Output with friends for fast food is one of the favorite dietary habits of adolescents and usually includes pizzas, crepes, sandwich, pancakes, sandwiches, desserts or frozen yogurt (more common in recent years). The problem is that most of these foods are rich in fat or sugar and thus rich in calories. At the same time, it is usually poor in nutrients such as vitamins, minerals and fiber. Also, the adolescent program (school, tutorials, activities) requires several hours outside the home resulting in the consumption of smaller meals (snacks) outside.

The truth is that the "homemade" food is usually healthier and more nutritious than the one we eat outside, but this does not mean that we can not consume fast food or snacks outside the home. The question is how often an adolescent is eating out, what he is choosing and in what quantities. Fortunately, nowadays, fast food restaurants offer many choices, with little fat (eg salads) and rich in fat (eg french fries). The consumption of fast food in moderation, can integrate in the context of a balanced diet and in the context of weight regulation. If you like fast food, they follow some tips to make smarter and quality choices:

i. At fast food restaurant

- **Be aware of portion sizes**

Usually at the restaurants the same food or portions of a dish is available in two or three different sizes (eg small-large or small-medium-large). Large portion means more calories and probably more fat, salt or sugar. For most people, small or medium portion is enough. It is good to prefer the smaller portion or the "kids menu" and avoid the large ones even if it is more economical, which is a trick of advertising (marketing). Alternatively, you could share a larger portion with a boyfriend or girlfriend.

- **Think before you order**

It is good to study well the list for available options and consider how much you need to fill your stomach. Beware of promotional questions like whether you want fries or some refreshment with your meal.

- **Avoid sauces**

Most sauces are used to accompany the dishes or salads. It is good to avoid those that are based on mayonnaise, ketchup or cheese sauces and to prefer those which are based on yoghurt, vinegar, lemon juice and mustard.

- **Prefer choices with less fat**

Grilled food as a way of cooking contain less oil than fried. There are two considerations referring to frying. On the one hand, food absorb too much oil and therefore contain more calories and on the other by frying the quality of the oil degrades while frequently in fast food restaurants, the quality of the oil used is not good. You can choose grilled instead of fried chicken, baked instead of fried potatoes and lean pie . Also, the straw is more lean meat from the skewered (both in pork and chicken), the same with turkey compared to bacon or ham.

- **You can form your options**

When you are about to order pizza, sandwiches, pancakes or hamburgers you can choose the materials to be put. For example, for the pizza, it is good to prefer a lot of vegetables, thin crust and a type of cheese or cold cut.

- **Remember that there are many options**

For example, at all the fast food restaurants you can now find salads. Also, sandwich or pita, or grilled chicken are lighter options from burgers or flaky pastries (pies, croissants etc.). You can order a salad to accompany your food to sate and share food with your friends.



ii. At school/tutorial

- **Prepare something from home**

The planning and the preparation at home of small meals (snacks) will provide you with more nutritional choices and at the same time you will save money. Easy and convenient snack for transportation could be a toast, a fruit, one cereal bar, few unsalted nuts or homemade pies (eg, cheese pie, spinach pie).

- **From the canteen what to choose?**

If you did not get something from home, the canteen is a good solution. It is preferable to choose bagel, toast or sandwich, cereal bar or natural fruit juice.

4.2.3.c Advice for adolescents who follow vegetarian diet

Adolescents and especially girls, often follow vegetarian diet, many times as an incorrect method in their effort to lose weight or in the context of experimentation or of awareness for the animals and the environment. In the vegetarian diet is usually excluded the consumption of meat and fish (*lacto-ovo-vegetarians*, who eat dairy products and eggs), or only meat (fish-vegetarians, who eat fish and seafood in addition to the lacto-ovo-vegetarians) or all food of animal origin are excluded (*only vegetarians*). Due to the exclusion of animal origin food or some of them (meat, fish, seafood, dairy, eggs) the intake of several important nutrients may be inadequate like: proteins of high quality (high biological value), omega-3 fatty acids (necessary for the organism), iron, calcium, vitamin D, vitamin B12 and zinc. So we need to find alternative plant sources of these components. The intake of these nutrients is usually adequate in the diets of fish vegetarians -and lacto-ovo-vegetarians while more attention is needed to exclusively vegetarians.



As already mentioned, adolescence is a special period, with increased nutritional needs. However, when a vegetarian diet is well planned and balanced can meet the adolescent needs of the in nutrients, especially if it includes eggs and dairy products. The nutrients, to which should be given special attention in a vegetarian diet are:

- **Proteins:** The teen should get sufficient quantities of high quality proteins (high biological value). He can meet his needs from milk, dairy products, eggs and fish (if consumed). Plant sources of protein (grains, legumes, vegetables, nuts, soya) are generally of lower quality than animal. For exclusively vegetarians, soy and its products (soy milk, meat substitutes, tofu - product like cheese from soy milk) is a good option as it can meet the protein needs like animal sources. It is also good to

make combinations of the above plant protein sources, for example rice with lentils, because in this way they increase the value of the protein of plant origin they intake.

- **Omega-3 fatty acids:** Their main sources are fatty fish like salmon, sardines, herring, mackerel and from plant sources oils of plants and seeds (especially of walnuts and rapeseed) and also some soy products. It may be required and intake of supplement in vegetarians who do not eat fish.

- **Iron:** Good sources of iron are both animal foods (meat, offal, poultry, fish) and plant (legumes, green leafy vegetables, nuts, dried fruit). However, the best absorbed form of iron by the organism is found in meat, poultry and fish. Soya is also rich in iron, in a form which appears to be directly absorbable. To increase the absorption of vegetable sources of iron (eg, legumes, spinach), it is good to combine them with sources of vitamin C (eg orange, lemon, strawberry).

- **Zinc:** Meat, offal, shellfish and mollusks, dairy, egg constitute rich animal sources of zinc. Plant foods rich in zinc are whole grains, soy products, nuts, peas, corn and mushrooms, which can be consumed by exclusively vegetarians.

- **Calcium:** Vegetarians who consume dairy products, can easier cover calcium intake. The only vegetarians would be good to consume plant sources of calcium such as almonds, fish eaten with the bones, legumes, green leafy vegetables (broccoli, spinach), tahini and also soy or almond milk fortified with calcium.

- **Vitamin D:** Rich sources of vitamin D are egg, liver, milk, fatty fish like salmon and margarines. The only vegetarians may have a low intake of vitamin D, which in combination with low intakes of protein and calcium, can adversely affect bone health. The needs can be met by eating margarine products fortified with vitamin D (eg breakfast cereals), exposure to the sun and also by supplement intake if needed.

- **Vitamin B12:** It is the nutrient that needs greater attention to exclusively vegetarians, as it is only found in animal foods (meat, eggs, dairy products, fish, offal). However, there are breakfast cereals and soy milk fortified with vitamin B12. Supplement intake may be needed.

Questions

1. Which are the main changes in the body during adolescence?
2. In which nutrients may adolescents have increased nutritional needs?
3. Could you name the role and the main characteristics of “protein” group?
4. Which are the factors that contribute to the development of obesity?
5. What should an adolescent reduce in order to lose weight?
6. What is meant by physical activity?
7. How can parents help adolescents to manage their weight?
8. Which are the main categories of eating disorders?
9. What should an adolescent avoid during the examination period?
10. Which are the nutrients that should be given special attention in a vegetarian diet?

Are you interested?

5. Further readings

- www.dietaryguidelines.gov
- www.choosemyplate.gov
- www.bda.uk.org
- www.kidseatright.org
- <http://eyzin.minedu.gov.gr/>
- www.eufic.org
- www.indi.ie

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