

Storyboard/Script Learning Video

Graphical user interface, text, application

Description automatically generated

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AGREEMENT NUMBER – 621707-EPP-1-2020-1-BE-EPPKA2-SSA

# Learning Outcome “LO2-A-B-1”

# Understand the impact of nutrition on development of diseases and human metabolism in a life-course approach and vice versa

# Responsible Partner/ author of storyboard:

MUG, Regina Roller-Wirnsberger & Carolin Herzog

**Title of video:**

Nutrition, the human metabolism & development of diseases

**Planned duration of video:**

Approximately 10-15 minutes

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| Scene Nr. | | **1** |
| Title *[optional]:* | Nutrition basics & impact on human metabolism | |
| Format: | Interview | |
| Setting: | University/ lecture room | |
| Characters: | Interviewer: Carolin Herzog    Interviewee: Regina Roller-Wirnsberger, Medical doctor | |
| Content: | **Question 1:**  Why nutrition and why do we eat what we eat?  **Answer 1:** There are various reasons why we eat what we actually eat. Complex processes and different potential factors ranging from physiological, social and cultural components can influence food choices. Individual-related determinants such as expectations or personal meanings can have just as much influence as external influences such as social and cultural factors, food availability, prices, advertisements etc. or physiological mechanisms that for example control hunger and satiety of people.  **Question 2**: But why is that? Why are we hungry or rather why do we need to provide our bodies with food?  **Answer 2:** The intake of food is necessary to provide the body with (required) nutrients and energy to support the growth, maintain as well as regenerate and repair of the body itself and thus the normal development and maintenance of health. Moreover, in most cases it helps the organism to function normally. The food supplied in this context is composed of macro- and micronutrients, each of these nutrients fulfills various and at the same time vital functions in the organism. No single food contains all essential nutrients in sufficient quantities, so that the goal of a healthy diet is to ensure the supply of all essential macro- and micronutrients through an appropriate composition of foods.  **Question 3:** Could you be so kind as to go into a little more detail about macro and micronutrients and at least mention what functions the major nutrients have in the body?  **Answer 3:** Sure. As already mentioned nutrients or respectively dietary substances can overall be divided into two groups, macro- and micronutrients. Macronutrients are the main nutrients and primary components of the diet and include:   * Proteins, composed of amino acids (for example contained in milk, meat or fish) * Lipids or so called fats (for example contained in different kind of oils)   and   * Carbohydrates (for example contained in pasta, rice or bread) including fibre   They either form the building and basic material that the body is made of (proteins, fat) or serve as an energy supplier and fuel to support the body function and keep it running (carbohydrates, fat).  Micronutrients on the other side are primarily:   * Vitamins, * Minerals (such as calcium, magnesium) and trace elements (such as iron, zinc)   Although micronutrients are more than less only required in small amounts in everyone’s diet, they are key components and, as cofactors, make an essential contribution to the functioning of the metabolism, a normal physical and mental development as well as maintaining good health. So that, for example, mechanisms of growth, energy production and other normal body functions only work through their participation.  Accordingly, the need for energy and the various essential nutrients is the quantity that the healthy organism must have available to maintain health and performance. However, the described need depends on and varies due to different factor such as illness, gender and age. | |
| Requisites/ Material: | * Calculator * Clipboard/ whiteboard * nutrient content book | |
| Additional notes for the scene *[optional]*:   * pop-up of a picture or a board with a picture in Answer 2 & 3 to demonstrate the distinction of macro- and micronutrients as well as their components. | | |

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| Scene Nr. | | **2** |
| Title *[optional]:* | Nutrition in a life-course approach/perspective | |
| Format: | Interview | |
| Setting: | University/ Lecture room | |
| Characters: | Interviewer: Carolin Herzog    Interviewee: Regina Roller-Wirnsberger, Medical doctor | |
| Content: | **Question 1:** Speaking of which, since we are talking about the needs and dependency of needs on different factors such as age, what changes in terms of nutrition in a life-course approach/perspective?  **Answer 1:** As already briefly mentioned before, the nutrient requirements vary according to different stages and circumstances in life.Consequently, depending on a wide variety of factors including height, weight and activity level beside the already mentioned factors of age, gender, state of health/illness and further factors. Special stages/phases in a life course concept occur in this context, for example, during rapid growth at a young age and during pregnancy, but also when metabolism slows down in old age, which affects the amount and composition of required energy and nutrients.  **Question 2**: Can you explain in a little more detail, which characteristics arise over the stages/ phases of the life-course?  **Answer 2**: Yes, I mean this is a very broad area of interest in general, however I will try to provide an overview and to keep it as short as possible.  Right at the beginning of life during pregnancy and lactation, adequate quality in nutrition is essential for healthy growth and development as well as appropriate supply for both child and mother. At the same time, the mother’s diet during pregnancy and lactation can already significantly shape the child’s later eating habits and taste preferences. The need for energy and protein but especially some vitamins and minerals is increased during these stages. Examples of micronutrients whose supply can become critical during pregnancy include the following:   * vitamins: * folic acid (e.g. green vegetables, legumes, whole grains) * vitamin B6 (e.g. chicken, pork, fish, whole grains, potatoes, lentils) * vitamin D (e.g. fish, egg yolk; UVB exposure of the skin) * and the mineral & trace elements: * calcium (e.g. milk and milk products, broccoli, calcium-rich mineral waters) * iron (e.g. red meat, whole grains) * iodine (e.g. sea fish, iodized salt)   As in the context of infant nutrition, exclusive breastfeeding around the 6th month of life is no longer sufficient to cover the infant's nutritional needs; additional food must be offered from this phase onwards. Particular attention should be paid to sources of iron and zinc (meat, grain) as well as nutrient-rich foods (fruits, vegetables) in general.  In addition to pregnancy and lactation, childhood is generally defined as an important cornerstone of eating habits; it more or less sets the course for later life.  In particular, factors such as developmental changes, physical growth and body composition cause the difference in the metabolism of infants, children and adolescents compared to that of adults. Due to these aspects, the younger a child is, the higher its energy and fluid requirements per kilogram of body weight. The nutrient requirement also differs from that of adults, so that individual micronutrients such as calcium, vitamin D and C are required to a greater extent in relation to the energy intake in children. Consequently, as part of the growth, food and nutrient requirements change accordingly from a qualitative and quantitative point of view; so that humans have the highest nutrient requirements during puberty.  Especially from school age on, it is important to pay attention to provide several regular meals in order to be able to ensure supply and performance.  Since increasing/higher age brings about numerous changes in the metabolism and body in general, such as an increase in fat mass while bone and muscle mass as well as water content decrease, certain characteristics in terms of nutritional needs arise in this later stage of the life-course. As a result of the age-related changes, energy requirement decrease, while the need for certain nutrients especially in terms of vitamins and minerals remains relatively the same or can even be higher than at a young age. The adequate intake of good protein as well as calcium and vitamin D suppliers is for example essential for the best possible maintenance of bone and muscle mass. Consequently, a diet adapted to the changed requirements is an essential component especially in this stage of life, in order to maintain health and performance as long as possible and to be able to optimize well-being. To meet the needs in this context, the quality of the diet and especially the selection of foods with high nutrient density has an important significance. | |
| Requisites/ Material: | * Calculator * Clipboard/ whiteboard * nutrient content book | |
| Additional notes for the scene *[optional]*: | | |

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| Scene Nr. | | **3** |
| Title *[optional]:* | Nutrition in context of the development of diseases | |
| Format: | Interview | |
| Setting: | University/ Lecture room | |
| Characters: | Interviewer: Carolin Herzog    Interviewee: Regina Roller-Wirnsberger, Medical doctor | |
| Content: | **Question 1:** Well, I can see from the previous interview/content that diet and nutrition determines health and presumably vice versa the development of diseases.But how exactly is nutrition related to health and disease or rather what makes us ill?  **Answer 1:** Health in general corresponds to an adequate supply of macro- and micronutrients. Both insufficient and excess intake of macro- and micronutrients can lead to health problems. Consequently, what we daily eat and drink affects our health and performance. While varied and balanced choice of food enables the best possible supply of different nutrients, there is a risk of over- and/or undersupply of individual nutrients in the context of an unbalanced diet. Subsequently, poor diet may impact certain non-communicable diseases, mostly caused directly or indirectly by a deficiency of essential nutrients in the diet. Most of the time in today’s society these are diseases associated with malnutrition or obesity.  **Question 2:** Which kind of non-communicable, potentially diet-related diseases exactly?  **Answer 2:** Poor nutrition and/or overeating can be described as risk factors that may contribute to the development of chronic non-communicable diseases including for example diabetes type II, hypertension, cardiovascular diseases, cancer and many other diseases. In this context, a major problem of industrialized societies is the excessive energy intake, in particular based on the increased consumption of energy-rich foods, high in fats, added sugar and salt/ sodium along with energy simultaneously low in beneficial nutrients. Together with physical inactivity, unhealthy diet can even be described as leading risk to health among the world.  **Question 3:** I once heard that earlier risk factors also have an influence on later disease development. Is that right?  Yes, you are right. Coming back to the life-course approach, (earlier) influences over the entire life span (staring in the womb) have an effect on a later manifestation of chronic diseases even if they underlie different mechanisms. Both undernutrition and overnutrition along with many other factors play a role and are negative influences in terms of the development of chronic diseases. For example, factors such as impaired glucose tolerance and an adverse lipid profile together with high blood pressure may already occur in childhood and adolescence and relate strongly to obesity. This tends to be clustered in the course of an unhealthy lifestyle and diet, which may include an immoderate intake of cholesterol, saturated fats, salt and a deficient supply of the body with fiber. Further increasing the risk by the lack of exercise. Other factors such as excessive alcohol consumption may come into play in youth and contribute to the development of further risk factors. Many of these factors continue to act throughout the life-course and result in a clustering of risk factors and health-related behaviors.  As a cumulative result of interactions/exposures (early and later factors throughout the life course) and age-related changes in the body, many chronic diseases actually appear later in life with adulthood or even ageing.  Based on the previously mentioned facts, it can be summarized that diet and nutrition play a pivotal role in maintaining health and preventing diseases, along with other factors such as lack of exercise and lifestyle. | |
| Requisites/ Material: |  | |
| Additional notes for the scene *[optional]*:   * Pop-up of a graphic in answer 2 that demonstrates the potential impact of food/ nutrition on the different body organs/parts. | | |

**Literatur:**

**Scene 1:**

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**Scene 2:**

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**Scene 3:**

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