MINISTRY OF EDUCATION AND SPORTS

The evidence and study of obesity with students of age 6-18 year old in our country

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1. Special thanks

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- The wonderful children and their parents, who never hesitated in becoming willing collaborators for successfully carrying out this enormous entrepreneurship.

- All the education directorates of all districts, with their devotion and methodological knowledge in making possible the collection of anthropometric indicator data according to the requirements of the reserach platform.

- The principals of schools, who integrated their work to that of physical education teachers, making possible in record time the gathering of written forms at the education directorate and consequently the study group.

2. Introduction

Considering the size of the test, the measurement of obesity with students of age 6-18 year old in our country is the first of its kind, not only within our country, but also in Europe and beyond. The test of more than 364437 pre-university students from all schools in our country, from the northest to the southest parts, has not been possible in any other country. Studies that measure the anthropometric indicators, therefore obtaining data for the body constitution and body components, are numerous because this seems like the topic of the day, especially in the developed Euroatlantic countries. However, considering the size of such study, ours is the biggest and most notable one.

The measurement of anthropometric indicators is an immediate need for all of the educational system of elementary and high school, a need which is related to the physical education and its impact in student's health in general. During our daily practice, the body mass and height indicators, those of waist perimeter and above gluteus are the most important because from them we are able to extract many data, three of them being the BMI (body mass index), the indeks of waist perimeter and the indeks of the ratio of the two perimeters.

The data for the body mass and height are related to the evidentation of the condition and prevention of all diseases, starting from cardio-vascular up to the neuro-muscular syndromes. The first evidence from measuring these two indexes is obesity. What is obesity? Obesity is an irregular accumulation of fat in our body, usually 20% or more of the body mass, a quantity that negatively affects the quality and longevity of our life.

The values that result from the indexes can change depending on the geographic specification, based on the heritage and the dynamic development of the populace specified by each place or country. This means that index values are normative and such norms have resulted from each country's studies undertaken over the course of many years. The comparison of normal values of indexes is only achieved for evaluation purposes and for comparing different regions or countries. For this purpose, we have also undertaken such study in order to find our values in the direction of indexes and for evaluating based on the weight and obesity within a pool of pre-university students.

In order to be more accurate in our measurements, we have trained school teachers in the theoretical and practical aspect, we have included social debates in our trainings. Hence, independent of whether the anthropometric indicators are already known or not from every individual who has finished high school, the authors' study group has consistently worked with devotion in order to clarify all details, not simply within the techincality of measurements, but also in order to specify the testing procedure and the collaboration with school directorates and the education directorates in different districts. All our wok is achieved voluntarily and without any monetary compensation.

Regarding the benefit of measuring anthropometric indicators, both physical and functional, the study of Elisabeth Quinn "How to affect and obtain values in the cardiovascular system by using long-distance runs and stability exercises" in About.com guide, June 29, 2009, reviewed from the Medicinal Board of USA, makes extensive use of such aspects.

3. Understanding obesity

Obesity is a chronic disease that is characterized by the increase in depositing the adipose tissue in our organism. This is considered as the primary cause for many serious pathologies that may even result in sudden death. In the medicinal language, we often encounter the term malign obesity (morbid obesity), which characterizes a high-risk obesity in terms of triggering a range of diseases. Normally, the adipose tissue (calories) represents an energy source for our organism and serves as a protective barrier for our internal organs and our skin. It is usually found in high quantity in the subcutaneous, articulations and around our internal organs. The appearance of obesity is cause due to the imbalance of calorie intake and calorie expenditure, and in such scenario are in favor of calorie increase and can cause an over-accumulation within our organism.

Some data regarding obesity. During the last decades, obesity has increased at a rapid pace all over the world. Today, more than 1 billion people are overweight, from whom 300 million are seriously overweight. Since 1990, the number of overweight people in Europe has increased more than three times. An alarming fact is the increase even among children. Furthermore, since 1970, we have a ten-fold increase of young people and children being overweight or obese. In a way, obesity now represents the new epidemic that is slowly spreading steadily all over the world. That's why people also call it "Globesity". Due to ignorance, underestimation, health naivety and social passivity, we can observe alarming rates of growth and associated health or social problems.

According to 2007 statistics of Great Britain, 60.8% of adults and 31.1% of children resulted overweight or obese, and nearly 30,000 people died every year due to diseases associated with obesity. A study taken from State Control of Great Britain evaluated that obesity was costing the National Service at least 500 million sterlings a year, whereas the nation's economy was loosing 2 billion sterlings a year in production. A recent study has shown that households of the 1950's

consumed more calories than today's women, but they weren't overweight because the daily routine involved more physical activity or physical load.

Factors. The etimology of obesity is multi-factorial, but the essential cause is overeating. Obesity can happen to everyone. However, some groups are more at risk of becoming obese. Other factors related to obesity are:

The biological factor : in some patients, the low base metabolism can often be the cause for the emergence of obesity.

The genetic factor : in some cases, it plays a key role in the emergence of obesity. In other cases, substances like the leptin protein can actually restrict obesity. In many obese people, we can observe defects in leptin receptors, which are a cause for the malfunctioning of mechanisms that avert obesity.

Moreover, our current lifestyles are considered a major factor in the emergence of obesity. The overconsumption of calories and the decrease in physical activities are both contributing to the increase of fat in our organism. Furthermore, damages of nuclei located in our hypothalamus that control our hunger can cause obesity through the hyperphagie mechanism (an increased sense of hunger as a result of damages in mechanisms that inhibit hunger).

The hormonal factor : based on various studies, we have noticed that an increased in the endocrine activity of the pancreas and hypercortisolemia present a risk and cause for obesity.

Factors that disrupt such balance are many, but the main factors consists of :

- Stress, tiredness, sadness
- Age
- Some medicines
- Hormonal imbalances
- Quitting smoking (the first stage or the first 12-16 months)
- Having extra weight after giving birth
- Heritage

Risks associated with obesity. Obesity causes a great range of disfunctions and pathologies in our organism, often becoming a cause for sudden death. The cardiovaskular aparatus is the one most easily affected and/or damaged. The increase in heart mass of the heart becomes the cause for the appearance of irregular heartbeat and atherosclerosis of blood vessels. When atherosclerosis causes an obstruction of coronary aa, this can result in acute myocardial infarction with fatal consequences. Diabetes as a cause of periferic tissue resistance against insuline has become quite frequent. Data of diabetic patients due to obesity have also been very alarming, especially when people of young ages are the ones also frequently affected. Respiratory insufficiency is another complication. It is characterized by difficulty in breathing

and lethargy, which can even result in coma. For females, we frequently observe amenorrhoea in the genital aparatus, whereas for males we frequently observe impotence. For both genders, obesity can become a cause for sterility. The skin of obese people can often form different kinds of erythemas or dermititis, whereas in the gastrointestinal tract we observe dominating phenomena like constipation or cholelithiasis.

Such catastrophic data have only become public seven years ago, even though it seems that we've heard of them all the time. During this period, we are faced with the first important report, according to which 300,000 people from the United States have lost their lives due to being overweight. At the same time, people spoke of it as a global epidemic ; "globesity", which was a way for making evident the 'progressive overweight of countries'. Such perspective was also considered by the WHO. "If we want to consider any kind of epidemic, whether being flu or something else, nothing is worse than the epidemic of obesity, especially in the sense of health impact for countries and our societies", has declared in 2003 Julie Gerberding, director of the 'Center for the Control and Prevention of Diseases' in USA. The predictions (formulated from the last congress about obesity, conducted in Sydney, Australia), anticipate that, withing few years, the spread of such phenomenon might compromise the longevity of human kind. A recent report has made public that 1 billion people are obese, which paradoxically has surpassed the number of 800 million malnourished people all over the world.

Quite a few people might end up with hypoglycemia. The crisis of hypoglicemia is preceded by unexpected weakness, with sweat and drowsiness. However, it can also be associated with paleness, headache and inability to concentrate. The reason always remains the same, lack of blood glucose. The glucose represents the primary source of fuel in our organism. While taken from food, it becomes necessary for the well-functioning of our cells, especially brain cells. That's the reason why we observe low energy levels and lassitude or lethargy when our blood glucose levels are low. The concentration of sugar in our blood is continuously regulated by two hormones : "glucagon" and " insuline".

The worst thing about obesity is not simply related to esthetics. It is actually a lethal disease. Moreover, it is one of the primary contributors in the creation and complication of diseases from a long list of chronic types. By listing some of the main global issues, 600 million people have arterial hypertonia, 177 million are with diabetes, 20 million with cancer, and 20 milion with ischemic heart disease of brain arteries. It was reported in 2005 that, due to the abovementioned diseases, obesity has caused the death of 35 million people: 7 million from ischemic heart diseases, 5 million from brain vascular accidents, 7 million from hypertension, 7 million from cancer, 4 million died due to diabetes, and 4.4 million from issues with cholesterol. Which wars, epidemics, or natural disasters have caused human kind a great catastrophe? If we also add the financial and psycho-emotional barrier related to their diagnosis and treatment, this becomes a huge burden for patients and their families, both individually or socially. The expenses are increasingly high, up to unafordable levels, both for devleoping and developed countries.

What are the diseases and health problems associated with diabetes?

- Heart (heart attack)
- Vascular system (blood pressure, atherosclerosis)
- Respiratory system (restrictive syndrome, sleep apnea)
- Hepato-biliary system (liver stones, fatty liver)
- Hormones and metabolic functions (diabetes, cholesterol, etc)
- Kidney functions
- Joints and muscles
- Skin
- Surgery risks
- Reproductive disorders and sexual disorders
- Psychologic disorders and social behavior disorders... etc.

Source for many diseases. Experts believe that obesity is the primary cause for the continuous worsening of our health, even more so than smoking. Being overweight is related to a series of health problems like diabetes, heart diseases, high blood pressure, some forms of cancer like breast cancer, prostate cancers, stress, anxiety, depression and infertility. Emphasis regarding fighting such scenarios is put in prevention and education of new generations towards a healthy diet and higher physical activity.

Overweight paradoxes. Poverty, inability and ignorance for choosing and buying the right kind of food, adequate for our health being, have created a new kind of malnutrition, which isn't so much related to the quantity consumed as it is with its quality: the composition, way of cooking, offering, buying and selling, marketing, new choices and preferences towards food and high calorific values. Especially within poor societal strata and unfavored population groups, we notice an increase in consumption of foods that are rich in sugars and animal fat, which are sold at a low price, but unfortunately endanger our health. As a consequence, obesity, which was feared before by the rich, now is also spreading in poor territories of millions of inhabitants.

The cheap market and obesity. The way we feed is affected by the average individual income, the food production, supply, distribution, marketing and consumption. The democratization and free market due to big socio-economic changes in the world enabled the increase in productivity, free exchange, globalization of the food business and the supply with varied types of foods. Besides pleasure, they have actually created new risks for the health of individual consumers, who overly consume potentially dangerous food for their health, particularly unprepared, industrialized, super-concentrated with sugar, animal fat, alcohol and with an overall high calorific level.

The free market and marketing create new dietary preferences towards food, especially in urban areas. Natural food and fresh products, vegetables, fruits, natural bread, milk and traditional products are left aside as something unfashionable. In their place, we see industrialized food, more often imported, ready or half-ready to eat (Fast Foods like sandwich, McDonald, Donner, Coca Cola, Fanta, Chocolate, and beverages with high alcohol content) with new tastes, but with very high calorific level, mainly based on fat, sugar and alcohol, and covering most of the market and our dinning tables. Parallel to that, we observe a gradual shift of the dinning place; from the tradicional family-based into the social one like bars or restaurants. Even the tradition of taking

food from home for later consumption while at work or school is being replaced with ready food that is bought in kiosks or ambulatory points, or automatically served in the business centers of schools.

The secondary risk, synergically related to the first, is the physical comfort. A new lifestyle is being spread, characterized with reduced physical and muscular activity. This comes from the urbanization, the massive displacement from the country to the city and the usage of vehicles, which replaced walking or using bicycles. We now have elevators instead of walking the stairs, a prolonged period of watching TV, computers, and an overall associated passivty instead of the active movement, sports and work that was previously tedious physical strain.

The problem is that food is not like the air we breathe. During breathing, our organism intakes and keeps only as much air as it needs, the rest is exhaled. This is not the case with food. Food is 'fuel' and by burning it our body's cells are continuously set in motion. Our organism doesn't throw away excess food, but instead deposits them as reserve 'fuel'. This is a protective physiological mechanism of our organism, which uses reserves in cases of low food intake. The depositing of excess calories is achieved in the form of body fat. This is formed from excessive calories and lack of mobility, from over-eating and inability to burn calories in our body from food intake. Despite having a positive goal when depositing slowly and progressively, when there isn't such balance, it can become a risk that looks like a "time bomb" inside our organism.

4. Physical Education and developmental factors

One of the greatest problems in the civilized world today is lifestyle, particularly for young ones and children. For this reason, physical education plays a particularly important role as the first developmental factor that can well-educate the new generations. However, independently of the meaning over physical education, emphasis should also be placed that in our country there is little or no understanding of the value of doing physical exercise. There are occassions when teachers of other subjects in elementary and high schools identify physical education with lost time or opportunity for becoming intesive with the daily homework. There are other factors as well, but the key concern should be addressed towards physical education teachers and their awareness for orderly arranging developmental factors for the positive approach towards physical education and sensitivity of external factors. For all mentioned above, we think that it is important to be in equal levels with conceptual intelligence, particularly relative to exact sciences.

Consequently, a question comes to mind: which factors inhibit the progress of physical education, particularly for young ones and children?

1. Parents' concepts, but those of teachers also, especially within natural sciences, still view children's participation with sports as an inhibitor of the progress of other lessons. Today, sport is treated everywhere not simply as a physical-funcitonal value, but also as an ability to assimilate stable knowledge over the time unit. Many thinkers have reached the conclusion that sports affect the nervous central system and, through this effect, we observe an increase in the ability to

assimilate knowledge, especially in terms of keeping us in a ready-like state towards learning for long periods of time.

2. The inability of physical education teachers, of physical conditioning methodists and trainers of professional competence related to the connectiveness of conceptual intelligence with motor intelligence. In order to explain such connectiveness, we can say that since intelligence is conceptual, it builds the knowledge of each of us in different fields of thought. Likewise, intelligence is the cause for building everyone's knowledge in different fields of mobility. With the evolution of human intelligence, since these two concepts have been associated with motor and intelligent sensors, by differentiating each of them and by starting from a common ground, there has been an obvious difference of one towards the other. Conceptual intelligence is developed by constructing our essence/soul in all fields of thoughts. Motor intelligence reaches and surpasses the sensory motor activity of body construction in different fields of mobility.

Motor activity is not integrated with the intellectual activity, nor should be mixed with it, but it finds its branches in the development of motor structures and coordination of new actions. In other words, techniques are considered as solutions developed from motor intelligence for solving any issues related to the environment, while being continuously renovated outside of the theoretical understanding. Sometimes, this environment is enriched with the presence of a teacher or a trainer, whose roles are oriented in helping the given subject to build or find solutions. Once the degree of efficacy and stability that characterizes every level of achievement is obtained, these techniques form the motor knowledge summarized from one level to the next, both in the ontogenetic and the phylogenetic planes. Moreover, it is necessary to study them as perfect models, but above all, to understand the development mechanisms.

Nowadays, there are many questions posed, but the most essencial one is related to the relationship between motor and conceptual intelligence. How much do they affect each other, what are the dependency and causal relationships that are created between them? One of the areas of reciprocal influence is the one of interest to the training of lecturers, teachers and methodists of fitness and muscle development, considered as relationships of consciously maintaining the meanings of **sense** and **feelings**. On the other hand, the relationships of motor intelligence to the conceptual one are achieved thru mechanisms that are extended outside of the concious field.

Example: It often happens that during the physical education lessons, particularly the techincal-physical program, for us to observe totally inadequate guidelines that may seem very well adaptable with the learning methodology, even though they are well-defined as clear ways of action and well-understood by normal students. The reason is related to the fact that it's not enough to only have good intellectual knowledge and a clear consciousness regarding what to do (or not to do). This happens for three primary reasons:

a) Consciousness, by carrying the action over the sports results, cannot act immediately and causally over the mechanisms or over the actions of mechanisms.

b) Since knowledge makes up a system of meanings that derive from past actions, it is specifically personal and with a self-observable image that is wrong and deformed. It is also necessary to have, but difficult to individualize, guidelines that do not represent the same meaning or idea for everyone.

c) The same conciousness maintains equal ratios of tried senses during the development of the action itself. This means that the action is achieved continuously in process and the senses are not a consequence of this action.

Therefore, now we better understand the need for discussions, descriptions, verbalizations by also carrying with us 'what needs to be done'. This must be understood in such a way that, as described by notable researches, can be considered as a stable and lasting connectiveness between the motor and intellectual intelligence with direct and indirect ratios of such connectivity. Nothing is built without moving, which means that the developer is movement itself. It can be the construction worker, or the architect that supervises the works. All this treatise has in its essence the opposite meaning to that of many teachers of sciences, particularly the natural sciences and in some cases the parents themselves regarding the fact that sports inhibit the progress of learning. Engaging in sports increases the readiness of CNS, which measn that sports increase the assimilation of knowledge relative to the time unit. This has already been proven scientifically and we are obliged to adopt such concepts and knowledge, as we are obliged to make them clear to others.

5. Physical education and the physical culture

Nowadays, everyone considers physical education as the first developmental factor that well-educates the new generation. However, despite the meaning over physical education, it is also important to notice that in our country there is little or no understanding over the value of obtaining physical exercises. There are occassions when teachers of other subjects in elementary and high schools identify physical education with a lost time and inability to be intensive towards the respective educational needs. We can mention several factors, but the key factor is about us, the physical education teachers, knowing well and properly listing the necessity of developmental factors for a positive performance in physical education and the sensibilization of factors that are external to us. For the abovementioned statements, we think that it is important for us to be on equal grounds with the conceptual intelligence, particularly that of exact sciences.

Consequently, a question comes to mind: which factors inhibit the progressive development of physical education, particularly for children or young ones?

1. Parental concepts, but also those of teachers and specifically those of natural sciences still view the participation in sports of their children or students respectively as a barrier to the progress of their lessons. All over the world, sports is treated not only as a physical-functional value, but also an ability for obtaining stable knowledge relative to the time unit. Many researchers have reached

the conclusion that sports stimulate the central nervous system and, through such stimulation, we experience an increse in adopting knowledge but also keep knowledge in a state of disposition towards learning for long periods of time.

2. The inability of physical education teachers, methodists of physical conditioning and trainers in training profesisonal competence for the connectiveness of conceptual intelligence with motor intelligence. In order to explain this type of connectivity we can say that intelligence, since it is conceptual in form, can build the knowledge for everyone in different fields of thought. Moreover, intelligence is reponsible for building knowledge for everyone indifferent fields of mobility. With the evolution of human intelligence and since these two concepts are associated with the motor and intelligent sensor, their differentiation starting from a common root has also enabled their distinctiveness. Conceptual intelligence is developed by building our 'soul' in all fields of thought. Motor intelligence is extended and surpasses the sensorial-motor activity for building our body in many fields of mobility (athletics, sprints, swimming, sports games, specific conditioning exercises, etc).

Motor activity is not extended with the intellectual activity, nor it should be mixed with it, but instead it finds its branches in the development of motor structures and the coordination of new movements. In other words, the techniques are the ones considered as constructed solutions caused by the enviroment and continuously rinovated outside of the theoretical understanding. Sometimes, this environment is enriched from the presence of a teacher or trainer, whose role is to help the subject build or find solutions. Once the degree of efficacy and stability that characterizes every level of achievement is obtained, these techniques form the motor knowledge that are summarized from one level to the next, both in the ontogenetic and the phylogenetic planes. Moreover, it is necessary to study them as perfect models, but above all, to understand the development mechanisms.

Nowadays, there are many questions posed, but the most essencial one is related to the relationship between motor and conceptual intelligence. How much do they affect each other, what are the dependency and causal relationships that are created between them? One of the areas of reciprocal influence is the one of interest to the training of lecturers, teachers and methodists of fitness and muscle development, can be considered the the relationships of mantaining the pedagogic action, which in different scenarios or situations can be systemized in conscious way with respect to the meanings of **sense** and **feelings**. On the other hand, the relationships of motor intelligence to the conceptual one are achieved thru mechanisms that are extended outside of the concious field.

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6. The aerobic metabolism and stability

The primary issue while working with long-term exercies is the combination of energetic systems that carry the right amount of energy to a young body, when they exercise with the right intensity, long-term duration and with methods conform the demand of stability and resistance quality. Meanwhile, it should be mentined that the aerobic metabolism supplies the students organism with the right energy sources only in those cases when they practice exercies for preparing on stability and resistance for long periods of time. Moreover, the student that aims to become an athlete and the trainer too continuously try to improve their capacity through exercises of high level of intensity and with high duration, which results in new values in the direction of energy exchange thru practice, thus obtaining an increase in the ability to release more energy over the time unit and in total. Simultaneously, it should be mentioned that factors limiting the efficient realization of high intensity trials are those of exhaustion up to a maximal extent. Sports training has shown that it can modify tiredness, and in extreme cases shifts the limit of exhaustion.

Maximal VO_2 and aerobic stability. Maximal VO_2 or obtaining the maximal consumption of oxygen is a factor that can define the capacity of practicing exercises related to aerobic resistance and stability. Max VO_2 referes to the maximal quantity of oxygen that an individual can use during exercises of duratio and high intensity, which reflects the maximal exhaustion thru exercises. This is measures in milliliters of oxygen used in a minute per kilogram or per kilogram of body weight (absolute and relative maximal consumption of oxygen). Usually, we can calculate that this ability can be increased up to 20% i normal conditions, whereas when qualitatively practicing exercices of duration, such increase can grow further.

Meanwhile, it should te stressed that stability is a widely used term in sports and implies an action and different adaptation for different individuals. In sports, this term refers to the ability of an athlete to perform exercises of duration up to several minutes, hours and events during a day. Stability needs a circulatory and respiratory system and such systems supply with energy active muscles that respond to our special demands. When many people speak of stability, they imply the aerobic system in general and sometimes it can be equated with cardiovascular fitness. With aerobic ability we imply the "performance of exercises in oxygenation conditions, where our organism uses oxygen to help with energy supply the performer during exercises". Meanwhile, the object of training for stability is to develop the energy production system in order to adapt it with the demands of physical activity for as much time as needed.

7. Energy channels

Our body converts food in carbohydrates in several ways by using the energy channels. Simply said, our body can convert the food sources in energy with or without the presence of oxygen. These two energy systems are:

- **Aerobic metabolism (with oxygen)**
- **Anaerobic metabolism (without oxygen)**

These energy channels can be subdivided into many categories. From this, whe add three energy systems that are most commonly used for exercice performance, which include:

- **ATP and CP, anaerobic energy channels that supply with small energy intervals that last from 15 to 20 seconds.**
- **Anaerobic metabolism: Glycolysis, which supplies with energy for duration up to several minutes.**
- **Aerobic metabolism, which supplies with most of the available energy for less-intensive exercises that are achieved in longer periods of time and require the presence of oxygen. Residue products like CO_2 and H_2O are removed through sweating and respiration.**

The type of muscle fibers and stability. Often times, students with high levels of stability have elongated proportions of muscular mobility (**Type I**). These fibers are easily movable and more efficient in using oxygen and generating more energy (ATP) for long or very long periods of time. They generate electrical impulses with a slower rythm than fibers with high mobility, but this impulse can continue for longer before it fades out. Thus, fibers with slower mobility are helpful to students who do running, perform exercises for long or very long periods of time.

Adapting for aerobic training. With the exception of duration exercises, our body is more able to produce ATP through the aerobic metabolism. The cardiorespiratory system and aerobic energy become more efficient for distributing and consuming oxygen in working muscles by converting carbohydrates and fat in energy.

8. Primary characteristics of the development of a growing organism

During the developmental process, our organism undergoes a series of legal, morphological, biochemical and functional changes. In science, the conventinal understanding of an individual's development (auxology) is growth and development. Usually, with growth we mean the quantitative benefit of our organism towards an active mass of the body as a result of the predominance of creation processes over decomposition ones. Development is the qualitative, transformational process that is prepared by quantitative changes. **Auxology** is derived from a series of functional states.

1. Growth and development are genetically programmed, even though the hereditary influence defines only the general plane of development. The conclusive realization of the genetic program in reality depend on the external, environmental influence.
2. Growth and development are achieved only in one direction and are composed of consequence and irreversible phase transition or special periods of our life. Changes in age have a non-uniform character. The accelerated development period is alternated with the decelerated periods and the realtive stabilization.
3. The individual development of our organism is not achieved immediately, which means that different organs and systems are formed according to our age and gender.

4. The influence of hereditary factors and that of the environment change with age. During the first years of life and during puberty, we observe an incrase in our organism's sensitivity towards acting factors of the external environment.
5. The effect of the external, environmental factors depends on their power. Weak actions do not cause a sensitive influence to our organism, whereas strong, and particularly very strong power can inhibit development. The greatest effect is caused by optimal or average actions.
6. External environmental actions depend on the so-called norms of organism, which are explicitly individual. Norms of reaction are dependent on age, gender, individual qualities, exercise and other factors.
7. In different stages of the individual's development, we observe a change in the ration of the two sides of converting matter and energy, the process of assimilation, creation, adoption of matter, and consumption of energy. During the period of the child's growth and the formation of his organism, we observe a prevalence of the assimilation processes, which are realized at high intensity thru the process of changing matters and energy, as well as corresponding, difficult organic creations.
8. In order to form an individual as a person, it is important to have the social environment, education, etc. If we change these factors of social environment and education, we can influence in sensitive proportions the individual's personality.

9. Age periodicity

Age periodicity. Age characteristics for building the organism and developing its functions that are natural in some of the stages of our lives enabled the determination of age periods. Therefore, the school age periods are classified as below:

Low school age…. 6 – 10 years boys 6 – 10 years girls

Average school age… 11 – 15 years boys 11 – 14 years girls

Youth ……. 16 – 19 years boys 15 – 18 years girls

The transition from one age period to the next usually signifies a change for the individual develpmental phase. During transitionary periods we observe not only quantitative age transformations, but also qualitative ones. Every changing phase is associated with specific achievements in the hereditary nature of those structures that can secure new specifics in the physiological changes, which must happen during the respective age period.

Likewise, the development of our organism is uninterrupted and the age limits of our age are conventional. Therefore, it is difficult to determine the end of one phase and the beginning of the next one. Similarly, every organism is developed in an individual way and has its own "seal" of development. Meanwhile, it is of interest to stress the distinction between calendar and biological age.

Calendar age might not match the biological one. For this reason, besides the calendaric age, we also consider the biologic age (physiological age). The biological age is characterized by the development of the physical level, mobility talents and motor abilities of children, the level of maturity, age of bone or skeleton maturity, development of teeth, etc. It is important to stress that the biological age in young and medium ages of school, with low indicators of physical development can fall behind the calendaric age up to 1-2 years, and in some rare instances up to 3 years and vice versa.

Motor aparatus. During the development of children we observe the beginning of the process of bone maturity of the skeleton, which also implies a change of the calf tissue with bone. The bone maturity process of different parts of the skeleton starts in different periods of time. Hence, the bone maturity process of their hand is realized during the age of 10-13 years old, for hand fingers during 9-11 years old, and the completion of such process is done in the shoulders and corresponds to the age of 20-25 years old. For females, this process is developed 1-2 years before males.

The deadlines for the formation of special bones is also done in different years and is closely related to specified phases of childrens' development. Therefore, the bone age is used for defining the biologic age. For this reason, many countries conduct the roentgenogram of hand bones, in which we clearly observe wrist bones and hand finger bones.

Development is characterized by the growth of bones in length and width. The increase in the dimensions of the bones is achieved non-uniformly. We observe periods of acceleration and deceleration of growth. The completion of the skeleton is reached during 20-25 years old. With age there also exists a change of the chemical composition of bones. There exists an increase in calcium salt, phosphorus, magnesium, as there exists bone hardness. At the same time, we can observe blood organs in our bones, which is the red blood marrow. With growth we also achieve the perfection of blood functions.

The development of the osseous tissue depends to a considerable degree by the growth of the muscular tissue. Childrens' muscles are fundamentally different by adult muscles. With the passing of age, there is also an increase in the size of our muscles. The increase of muscles is also done non-uniformly. High rhythms of growths are a characteristic for the muscles of our teeth and low rhythms are usually found in the muscles of our hands. The weight of muscles that react faster and are overloaded increases faster.

During growth, we observe the forming of the motor system, through which it is possible to evaluate the size of stress, the speed and accuracy of mobility over space. For example, for students of different age groups there was a proposition that they move some steps with closed eyes. Though this experiment, it was possible to determine the size of deviation from the straight line, meaning the ability for estimating the direction while walking. For students of age 14 years old, the accuracy of movement gradually improves and then stabilizes. A similar developmental progression was also obesrved during the test of long jump without running. The ability of the motor system also

happens during the formation of essencial movements and during the development of motor qualities.

Jumping as a difficult motor talent that requires a considerable development of the muscular force and display speed only during the third year of life. Afterwards, there is an increase in the jumping length. The highest increae is observed for children of ages 13-15 year old, then it reaches the highest level up to age of 20 years old. For people doing sports, the most intensive increase of jumping ability is fixed between ages 14-16 years old for males and 13-15 years old for females.

Between the development of motor qualities (power, speed, stability) and the formation of motor talents (versatility and flexibility) exists a close interrelationship. The development of qualities and motor talents is achieved during the process of perfecting movements.

Qualities and motor talents are formed non-uniformly and not in due time. The highest achievements happen at various ages and depend on the functional state and a series of systems in our organism. Therefore, stability is defined by the action and ability of blood vessels, respiratory system, and the maximal consumption of oxygen.

Power as a physical trait is closely related with the bone growth, the growth of muscular tissue and the ability of articulations. It is also related with the ability to coordinate movement through msucles and links.

Speed is evaluated over the latent time, the motoric reaction and the density of movement. Speed is defined by the mobility of nervous processes, muscle coordination, developing features and the retracting muscular ability. Reaction time depends on age and is exactly related with it. For different groups of muscles, the reaction time is not the same. Even from age 11-12 years old, young sports people reach the highest level of movement speed. Aftewards, this ability is stabilized and starts to weaken, but it is not noticeable because it is closely related with the quality of power. Therefore, the ability to cover a running distance in the shortest possible time is related, besides the abovementioned elements of speed, with the running power, or the step size. If the density of steps when 12 years old reaches the highest level, then it starts to fall, and with it we observe an increase in power, which in this specific case is called the running power. The inevitable relationship between these two qualities makes possible the formation of wrong perceptions, thus reaching a wrong conclusion that speed increases even after 25 years old.

Agility, or the ability to perform coordinated movements, is reached in coordination with central mechanisms of movement directions. One of the manifestations of agility is the accuracy of orientation movement over space. Children of ages 5-6 years old have such ability at low levels. The highest increase of such ability is reached during age 9-11 years old. Then, during 12-14 years old, the accuracy of moving over space reaches the maximum and stabilizes. Meanwhile, it should be mentioned that regular exercise based on scientific criteria increases the ability and accuracy of moving over space. Likewise, during the development, we observe an increase in growth rates. Therefore, during 7-8 years old, we observe a considerable deviation from the

given rythm in the rotation of the bicycle pedal. For 13-14 year olds, this indicator reaches the maximal level (Farvel V.C.). In this way, during the developmental training, the ability to coordinate muscular actions is perfected. Age groups of 11-14 year old has the highest rythms of developing and achieving very difficult movements of coordination.

Flexibility, the motoric ability, is defined as the primary indicator for achieving movements of high amplitude, which is consequently related to the mobility of joints and the influence of the central nervous system. With the development of our organism, flexibility changes in a non-uniform way. Therefore, the mobility of the spine is increased considerably for ages 7-11 years old for males and 7-10 years old for females. Then, moblity stabilizes and, after ages 14-16 years old starts to fall. Meanwhile, for other links like shoulder joints and the femur bone, mobility during stretches and twists is increased up to 12-13 years old.

The development of qualities and motor abilities doesn't only depend by the calendaric age, but also by the biological age. The higher the biological maturity, the higher (as a rule) is the muscular power. This change is particularly noticed for age groups 11-15 years old. In the methodical plane, we use the long jump and triple jump indicators without running; indicators that can make us clearly observe the biological age. This draws our attention in the fact that, during the school hours of physical education, we must also carefully observe this meaningful and highly productive process if properly evidenced.

For further diagnosis of the biologic age, we usually use data like the appearance of primary and secondary signs of gender, the density of armpit hair and over blood vessels.

10. Feeding in the context of physical activity and health

Only few people would doubt that feeding in considered a key element towards a healthy lifestyle. However, recent systematic studies have adapted their directions based on recommendations of feeding, even though many of such contemporary recoomendations aren't based on science. Therefore, we must consider the fact that physical activity influence in general isn't clearly taken into consideration in any of the studies done with subjects feeding. It is clearly observable that it's difficult to reach conclusions, even if we base our data on high-level tests.

Different recommendations in the context of feeding have been spread for a long time, but all of them only give general knowledge. Besides that, we also have to deal with total fat limit with around 30% energy (E%) of acid fat with not more than 10 E%, as well as salts with not more than 5g per day. Moreover, consequences of limitation of total fat has resulted in recommendations of mainly carbohydrates for children and young ones, which usually is around 50 E% or more (e.g. 60 E% in German speaking countries). The most interesting part is that all

four abovementioned recommendations, for “healthy” young people that aren’t active, aren’t reinforced by scientific data or aren’t discussed any further. Quite interestingly, these recommendations have had strong critiques for a long time, since their principles are in compliance with lately-adaptable testes with respect to areas of feeding. Before the urgent need of tests coming from the medicine field and the corresponding tests based on feeding, general recommendations usually emerged from consultations with field experts, who often didn’t refer to a systematic scientific literature. This is particularly true even for some health organizations with considerable influence like WHO (20).

Luckily, at least two study branches worked parallel and simultaneously in the field of feeding, both important and necessary for experts that are interested in the practical aspect. The first positive aspect is that, at last, the value of recommendations is increasing and develping by referring to higher scientific standards (e.g. by using science-based tests). In the field of medicine, the highest-level tests are generally attributable and controllable according to systematic studies. Meanwhile, when we observe so many available studies, like for example clinical studies on the short-term or long-term effects of medicines or supplements used in sports performance, they cannot be used for studying the ffects for long-term modificatins in feeding to the symptoms of various diseases. Such effects should be supported and followed by studies with longer target periods by using thousands of subjects that are monitored and studies for many consequent years. The highest level of data is attributable to the systematic summary of recent studies with respect to feeding and health.

Both models, the quantitative and qualitative summary model of perspective studies are achieved in such way that it is possible the investigation of the relationship between the total carbohydrate intake, the glycemic index, proteins, fat, acid fat and the expectation or cause of diseases. The first systemic summary that studies the relationship between the quantity of acid fat taken and heart disease was published in 1998. It concluded that heart diseases weren’t realted with the E% of acid fat. The result was overly criticized and the author was also negatively assessed for the fact that his resulting data of such summary have already been confirmed many times, also lately in 2009 by the Consulting experts of the World Health Organization for fats and fatty acids in the nutrition of the human being part of the Food and Agriculture Organization, which this time has used a systematic meta-analysis to study this link. In the same report, it concluded that total fat intake by more than 58% was not associated with heart disease.

In contrast there is sufficient evidence of systematic summaries taking into account approximately 2 million subjects which show a positive correlation between high glycemic index or load and heart disease, diabetes, and other diseases of modern times. So the majority of the evidence available does not comply with the recommendations that are necessary amount of carbohydrates and fats to be taken by students in general.

Moreover, the general recommendations which limit the amount of salt necessary that a student must take in no more than 5g per day, can be dismissed quite simply. Every physiologist and

sports nutritionist knows very well that the sodium lost through sweat can be substantial and thus excluded that the daily amount required 5g, making this limit inconvenient for all students. Moreover there are data to show that a lower amount of salt if taken less than 5g per day this can increase the risk of heart disease. However, a general recommendation is that students in general reduce the amount of salt that should be taken in less than 5g per day, but this fact is not based on accurate data.

The second paradigm is that food is starting to become greater than the quantity of food components, and the influence a a particular food shouldn't be limited only to one person or to some of its elements. The same element can have different effects in the metabolism of a student if compared to the origin of the food because it might be packaged and refined in different ways that affect the validity of its components, or it could perhaps interact in different ways with the rest of the elements. This might bring adverse effects in taking foods compared to the estimated effects that can have one or many components present in the specific food.

The classic paradox coming from the second paradigm is the effect of caffeine relative to the influence of the coffee. While caffeine has shown that decreases insuline sensitivity, drinking coffee is closely and regularly related to the reduction of diabetes risk. However, the biggest problem and concern coming from the great development in the field of feeding and with the previous change of its recommendations still remains unresolved: the confusing effect of (in)activity. It is generally accepted that peforming physical activity in a regular way improves health, whereas a sedentary lifestyle increases the risk of diseases and mortality. The main problem lies in the fact that, up until now, physical activity hasn't been included or studied in an objective way as part of studies done on feeding (this is usually achieved in a subjective way by questionnaires that can form an excessive report on physical activity). In the only study regarding the confusing effect of physical activity in a relationship between dietary factors and mortality, all dietary effect were removed when physical activity was considered in an objective way.

The provocative conclusion should be that, for as long as you are physically (cardio) active, you can eat little or much of what you like, without having any impact on the risk indicators of mortality.

This situation in some ways contains two meanings. From one hand, it is good to view a physically active person representing a normal status, as nature has provided him with, and it is highly likely that this model will not have to worry about his/her diet (for as long as he considers the basic recommendations). However, on the other hand, it is difficult to accept, if we want to be honest to ourselves, that even after 2 centuries studying feeding, we still don't know much regarding the effects food has on the human body. When it comes to making or giving recommendations about the way of feeding, we are faced with many problems. Due to the lack of controlled studies, we must rely only in some aspects that seems to be too 'strong'.

After a choice of varied and different foods, it seems as a good option to direct our attention to natural products as compared to packaged ones that might only have one food ingredient. Even more so, when a varied selection of all foods must guarantee the intake of all possible and necessary ingredients (e.g. not only some ingredients that are frequently used like carbohydres, fat, proteins, vitamines, minerals, but also hundreds or thousands of other food ingredients). There are few available tests that suggests that an (non-natural) increase of one of some food components can bring an improvement in health. In essence, it is likely that possible dietary recommendations should support the fact that students should try as much physical activity as possible and use as many possible natural foods as possible.

Meanwhile, there is also a need for some specific recommendations:

1. Sufficient physical activity is quite beneficieal for our health than any kind of diet, and most of adults that consider physical activity (e.g. >30 min/day of moderate physical activity) don't have to worry about their diets.

2. Many contemporary recommendations aren't yet based on scientific facts, therefore it is not true that taking a total quantity of fats or acid fats is closely related to an increase in risk for cardiovascular diseases, whereas as a contrast, the inex/load of high glycemic level increases the risk of cardiovaskular diseaes and diabetes.

3. We should always provide ourselves natural food, not industrialized ones.

11. Study methodology

Bazed on the study theme we have been able to prepare the study platform, a platform that guides us in concentrating in these key aims:

1. The determination of anthropometric indicators in children and young ones of ages 6 to 18 years old is the starting point of evaluating their health today, particularly with reference to the future, and for this reason we are studying three indexes starting from the main one in evaluating the development of body constituents and the level of obesity.

2. Besides measurements and conclusions reached with students of schools on a national level, we also prepared a collection of materials for informing and preparing students with weight problems or those wanting to continue systematic aerobic or anaerobic training, or mixed ones. These materials will help in informing teachers of physical activity and teachers of other subjects as well.

3. The processing of the theoretic thought and the creation of accurate convictions and concepts on obesity, the risks and evidenncing of obesity for people of young ages. Besides that, this is the

first study of such proportions in our country and, as such, its value is worth mentioning and creates a positive awareness for parents and the civil community in general.

The object of the study is measuring body height, body weight, the perimeter over gluteous and waist perimeter for students of schools on a national range with age 6-18 years old. These subjects were tested under optimal conditons, the same for everyone and no students was experiencing some disease or metabolic disorder. Likewise, the testing was done with the students concent, without imposing on them. The measurements were divided according to gender, separately for males and females, and separately for students of first grade, second grade, and so on, up to 12th grade.

AF Vajza-Djem	AMU Vajza-Djem	AML Vajza-Djem	Nr. Total Vajza-Djem
142.277	**134.174**	**87.986**	**364.437**

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The evaluation of the body mass index is achieved through four anthropometric indicators: body mass, body height, perimeter of waist over gluteous and perimter of waist over navel.

Likewise, we have analyzed and considered the scaling of such anthropometric indicators, and through such scaling we have reached our prognoses about body height and weight, as well as waist perimeter.

For the completion of this stucy, we evidenced and filed a large amount of Albanian and foreign literature. The study and acquisition of such literature was mainly used for the first time, while studying data in the diretion of the composition and components of body and obesity.

All measurements done pertain to the month October, 2015 and were evidenced in the respective tables. These measurements had undergone the calculations of BMI and Obesity, based on the formulas specified by the American College of Public Health (interpretation of body mass index).The range within which a person's BMI falls will help determine whether they are of a healthy weight for their height. The ranges are as follows:

Weight status	**BMI**
Starvation	<15

Underweight	<18.5
Normale weight	18.5-24.9
Overweight	25-29.9
Obesity	30-40
Morbid obesity	>40

The evidence and calculation of data, together the the associated chart were done with Microsoft Office Excel, from which we obtained the desired results.

The second phase pertains to measurements and comparisons of age groups and genders in order to observe possible differences and, through the statistical evaluations, we gave such changes an average value.

Through the method of analysis, not only we clarified the obtained data, but we simultaneously defined the level of BMI for our subjects by forming an accurate overview of problems regarding obesity.

12. Results and discussions

The measurement of students of schools on national level from ages 6 to 18 years old is perfomed through four indicators. We have measured the body height, body weight, waist perimeter over navel and the waist perimter over gluteous. The physical characteristcs of the subjects are shown in Table 1. The measurements are realized from physical education teachers according to a published protocol, then further compiled by the authors of this study. All conducted measurements from physical education teachers are sent to the respective education directorate. Then, the data were sent to the study group, who further processed them statistically and comparatively.

The following tables have the conclusive data obtained from measuring body height, body mass, perimeter over gluteous and perimter over waist. From these data, we have obtained indexes over height, of BMI and conclusions for obesity obtained from waist perimeter and norms provided by APHA (American Public Health Agency)

Table 1. Table of anthropometric data for the city of Berat

Parameter	Subjektet	Elementary School (6-11 vjeç)	Low High School (12-15 vjeç)	High High School (16-18 vjeç)

Age (years)	Girls	8.36	12.82	16.37
	Boys	8.52	13.0	16.51
Body mass (kg)	Girls	28.0	45.68	53.62
	Boys	29.0	48.16	64.23
Body height (m)	Girls	1.31	1.56	1.62
	Boys	1.33	1.59	1.74
BMI (kg/m^2)	Girls	16.3	18.7	20.4
	Boys	16.5	19.0	21.3
Waist perimeter (cm)	Girls	58.27	68.0	68.96
	Boys	60.33	67.73	73.60
Perimeter over gluteous (cm)	Girls	69.0	86.0	90.55
	Boys	70.38	82.55	89.67
Ratio (Pb/Pg)	Girls	0.85	0.79	0.76
	Boys	0.86	0.82	0.82
Normal BMI	Girls (number)	2580	2339	1765
Overweight		21	97	77
Obesity		3	16	5
Normal BMI	Boys (number)	2841	2439	1647
Overweight		27	96	135
Obesity		1	33	16
Shwnim: *Total: $Nr_{subjects}$= 14138, from whom: (Nr_{Girls}=6903& Nr_{Boys}=7235).*				
Age group 6-11 vjeç: (N_{total}=5473; N_{Girls}=2604; N_{Boys}=2869)				
Age group12-15 vjeç: (N_{total}=5020; N_{Girls}=2452; N_{Boys}=2568)				
Age group 16-18 vjeç: (Nr_{total}=3645; Nr_{Girls}=1847; N_{Girls}=1798) vjeç				

13. Literature

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