DIETARY HABITS AND NUTRITIONAL STATUS OF CHILDREN IN PRESCHOOL AGE

Gordana Panova[1*], Violeta Dzidrova[1], Lence Nikolovska[1], Gjorgji Shumanov[1], Svetlana Jovevska[1],Blagica Panova[1], Nenad Panov[1]

[1]Faculty of Medical Sciences, University Goce Delcev, Krste Misirkov bb, 2000 Stip, Macedonia

[*]e-mail: gordanapanova@gmail.com

Abstract

Early childhood is the most important for the overall development of the personality. During this period, each child realizes that it is an independent entity, and it expresses certain requirements, desires, actions, proceedings and behaviour. Our research aims to display nutritional status and degree of obesity among preschool children in the Republic of Macedonia and nutritional quality of their diet.

Because of the increasing incidence of obesity in childhood and its consequences as a public health problem, the Institute of Public Health in Skopje implemented activities to assess the growth and nutritional status of children from the Republic of Macedonia. The study included preschool children from Veles, Kocani, Kumanovo, Skopje, Strumica, Prilep and Stip. Activities were conducted during 2013 by a unique methodology in the procedure of monitoring the growth and assessment of nutritional status among children in 1995 before the start of the first school year, first grade. The results were processed by standard deviation method.

Deviation of the body mass in the examined population of the children aged 7, in the range of +/- 2 and 3 SD. Malnutrition with deviations in growth was found in 0.7% of the examined population group and moderate malnutrition was among 3.3%. Overweight and obesity was found in 28.4% of examined children. Since 1995 examined preschool children 5.6% were very obese children.

Disruptions in the nutritional status such as malnutrition, and particularly state of obesity have roots in early childhood. Therefore it is very important to do prevention at an early childhood preschool age with proper guidance in eating habits and lifestyle and promoting physical activity.

***Key words**: Nutrition, Pre-school children age diet.*

1. Introduction

Childhood in pre-school period is a crucial time for human growth, development and maturation, in which changes occur in the body. Monitoring and evaluation of the process of growth and development in this period is of a particular importance. The relationship of this early period of biological maturation gives us the opportunity to carry out certain activities aimed at preventing health problems characteristic of the later ages[5]. The fact that most of the risk factors associated with inadequate diet and changes in lifestyle habits that in most cases begin in childhood and are passed into adolescence, linking them with prevention, which should start in the early period of child life. Many scientific findings point to the importance of nutritional deficiency during the development in preschool age[1].
The healthy food as an important health factor. It is a real nutritional bible that every family should have. In a child's world, parents are primarily responsible for the children's nutritional status, as well as for the habits and rules for children to follow and observe in everyday life.
Children organism is much more sensitive than adults in terms of accuracy and errors in diet. From the diet depends what will be their health and their future abilities [2]. The relationship to food is the attitude towards life and therefore children should be actively involved in growing some vegetables and fruit, in order to observe the process of creation, preparation and proper consumption of the same [5]. The findings obtained in this way are durable and effective, because they create the basis for substantive properly established relationship to nature and spiritual values necessary in the life of every person who lives in harmony with itself, its environment and works not only for their own benefit, but for the society of origin.

Rules for proper nutrition means:
- Total energy value of food;
- The composition of food depending on age and activity;

- The right attitude to individual compounds and
- Way of preparing food.

As early as preschool age children should be familiar with the proper nutrition pyramid (Figure 1). The base of the pyramid in the proper child`s diet is eating cereals, then vegetables and fruits, dairy and meat products. According to many pediatricians, education on how to feed children should be applied in schools.

Figure 1. Pyramid on proper nutrition

Preschool and school-age children do not have healthy eating habits. Recommendations of the doctors are the proper diet for each child should be initiated by the mother, and starting from the period of the child's conception [1].
All impacts that human needs for proper development improve and strengthen his fitness. This can be achieved through: protection of mental health, active immunization, right attitude towards work and to rest, proper nutrition, and environmental factors: clean water, clean fresh air, sunshine, etc., physical education, summer vacation, health education. The education of preschool children will allow in the institutions for their accommodation mostly healthy food to be used. There are many ways and methods that can strengthen the body and improve the health of children and youth.

The good and proper diet does not mean that the child can not eat what it wants to or that it must eat what it doesn`t want. It actually means variety and moderation in diet. The child can choose certain foods because it is tasty or as "just" that has the menu [9].

Regular meals and nutritious snacks include food rich in carbohydrates, fruits and vegetables, dairy products, meat, fish, poultry, eggs, legumes plants. It is necessary to offer enough fluids, especially if the weather is warm or the child is physically active. Water provides a good hydration of the body with no calorie intake. The children who are five or older should have smaller and diverse portions, which will contain food from all groups:
- bread, cereals, potatoes;
- meat, fish, eggs;
- fruits;
- vegetables;
- milk and dairy products.

The most common eating disorders which can occur as a consequence of reduced or increased energy intake are:
- anemia;
- anorexia, bulimia;
- obesity and comorbidities;
- problems of the reproductive system (amenorrhoea);
- inappropriate eating habits (large intake of fat and salt, skipping meals) [3].

Children of a certain age have an increased appetite, but because they are growing despite increased eating they don't gain weight [4]. The aim of the research is to show the nutritional status and degree of obesity among children of school age in the country and the nutritional quality of the diet [6].

2. Materials and Methods

2.1 Materials

Because of the increasing incidences of obesity in childhood and its consequences as a public health problem in the country, the Institute of Public Health in Skopje implemented activities to assess the growth and nutritional status in children from the Republic of Macedonia. The study included 1995 examined preschool children from the following cities: Veles, Kocani, Kumanovo, Skopje, Strumica, Prilep, and Stip.

2.2 Methods

Nutritional status

Nutritional status is a condition of nourishment that depends on dietary intake and their use in the body. Assessment of nutritional status is done by the following tests:

1. Anthropometric studies

They assess anthropometric characteristics of the individual and the population in general, giving an opportunity for monitoring of hormonal changes in the directed growth and maturation, and thus early detection of disorders in the period. Anthropometria provides indicators and nutritional status detection of possible health risks and may diagnose a state of malnutrition and / or obesity and Body mass index (BMI). BMI is defined as the body weight of the person in kilograms divided with his height square metres (kg /m^2)

There are: Basic anthropometric measurements and derived anthropometric values.

The basic anthropometric measurements determined in this study were:

- Body height (TV).
- Body weight (BW).
- Thickness of skin folds (DBP).
- Volume humerus (OH).
- Volume structure (OS).
- Size of hips (UK).

Other determined anthropometric values were:

- Relative body weight (RTM).
- Body mass index or (BMI).
- Percent body fat (% N).
- Relationship structure / hip (CPD).
- Area of the upper arm muscles.

2. Dietary trials - determination of total energy intake and intake of macro and micronutrients in order to determine dietary habits in people. Application of tables for nutritional content of food, food and drinks, especially the electronic databases (Food-Based Data), that include traditional food.

3. Biochemical tests –Clinical nutritional overview, history, medical history, medical nutritional therapy-MNT (medcal Nutritional Therapy) which includes two components: planning and implementation.He is implemented by the algorithm for treatment and practical nutritional recommendations based on evidence (Evidence-Bazed Nutrition Practice Guidelines) .They are applied as an objective tool for assessing the nutritional status because of the ability to detect subclinical deficient condition or state of risk to the occurrence of structural and functional changes in the body or any apparent clinical signs of a disease or condition .

4. Functional testing - to measure the functional and physical abilities of the body or individual tissues or organs, changes that indicate a deficiency of certain nutrients or conditions of risk. Application of tests to determine the functional capacity of the cardiovascular system, KBC, focusing on functional tests improving.

5. Clinical trials:clinical trials, biochemical parameters, specially designed questionnaires, before using abbreviation for the first time please write a full name ADL(activities of daily living), for beneficiaries who have limitations in activities of daily living, IADL- (Instrumental ADL).

Systems qualitative and quantitative grading of nutritional status, detection of different clinical types; daily intake, RDA- (Resource Description and Access,) same as before. Software programs for the analysis of dietary and nutritional status. Which of mentioned metthods you used in you research. Please do not write general statements, but concrete methods that you used.

3. Results and Discussion

3.1 Results

Body mass index for age is important to assess the nutritional status of children in this age, as well an opportunity to determine the situation of malnutrition and rates of obesity. The table below shows deviations of body mass in the examined population of children aged 7 , and discounts within +/- 2 and 3 SD.(Duke Health profile).

Table 1. Body mass index for age in children of 7 years in the Republic of Macedonia

Sex	Body mass index at age %				
	< -3SD	< -2SD*	> +1,SD*	> +2SD*	> +32SD*
Male	0.9	3,7	30,8	17,8	7,8
Female	0,6	3	25,8	12,8	3,3
Average	0,7	3,3	28,4	15,4	5,6

*DUKE Scale BMI Median cutoff Mean (SD)

Malnutrition with deviations in growth was found in 0.7% of the examined population group and moderate malnutrition in 3.3%. Overweight and obesity was found in 28.4%. From 1995 examined preschool children 5.6% were very obese children. In addition, 40% of overweight children had elevated blood pressure, and in one third of children in this group was observed fat formation in the liver. According to the data in the Republic of Macedonia, there is an increase of children who are with risk of obesity.

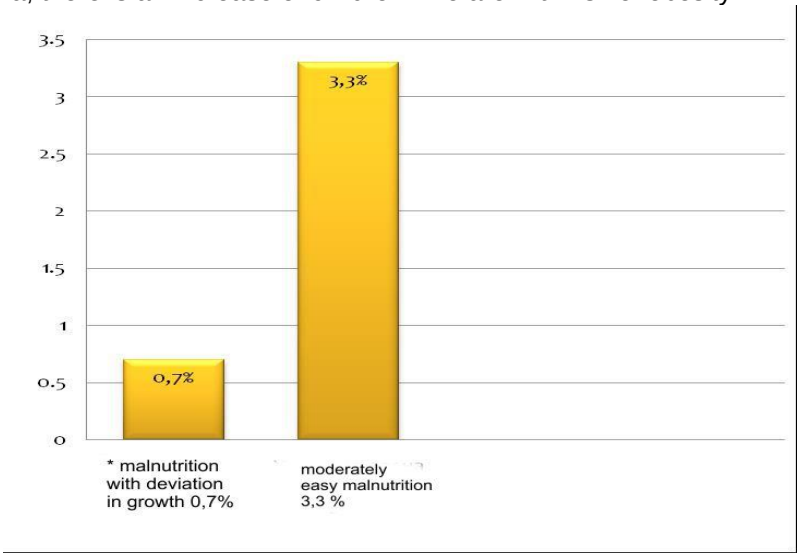

Figure 3. Results of malnutrition among the population surveyed

The average values of minerals shows a surplus in sodium intake and moderate deficiency in calcium intake.

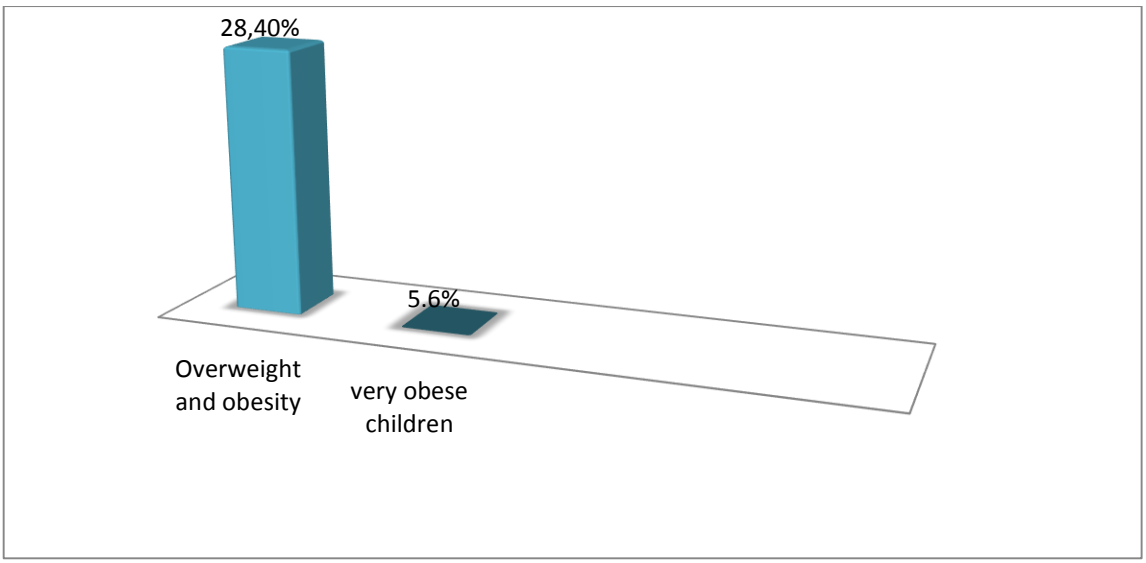

Figure 4. Results of 1995 examined preschool children

The content of the groups food products in the daily meal in this population group shows that, the the average bread and pasta are represented in a daily intake of 518 g, milk and dairy products with 220 g, the meat with 57 g, fish 21 g, eggs 23 g, meat products 56 g, the vegetables 145 g, fruits 82 g, oils 20 g, and sugars and concentrate with 33 grams [7].

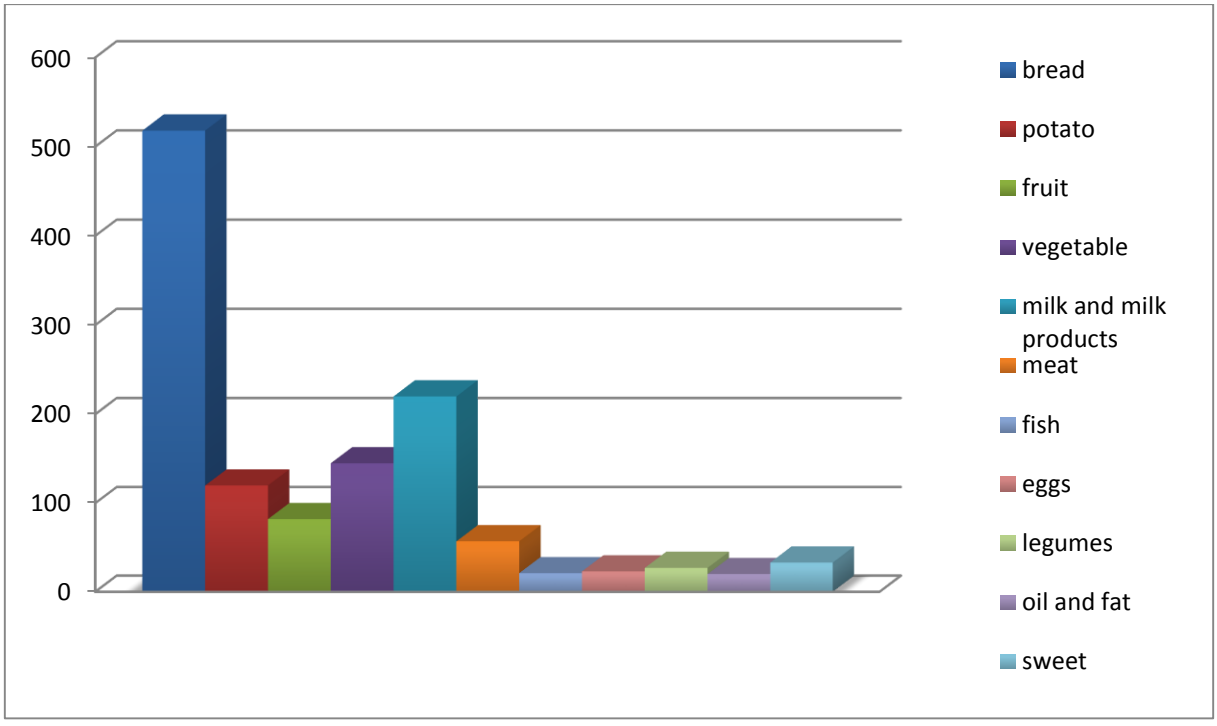

Figure 5. Contents of the daily meal

Nutrition shows variability in terms of total energy per day, and there is unbalanced intake of essential nutrients with a higher intake of fats. There is insufficient intake of fresh fruits, vegetables, fish and whole grain products, and sufficient intake of legumes[8].

Certainly more kids stay indoors, so the probability of viral and bacterial infections is increased [3]. With the help of a healthy diet, which should be represented both at home and in preschool institutions and schools, prevention of these infections is highest, This will confirm the Hippocratic thought: Let food be your medicine and let your medicine be your food.

The wisdom of nature is unlimited, so at this time gives us a high energy, rich in starch - fruit. Evidence of this is present in the form of vegetables, different roots (carrots, beets), winter cabbage, broccoli, cauliflower, spinach, and the fruits: apples, quinces, pears, medlar and southern fruit (oranges, lemons, bananas).

Overall, the large presence of fresh fruit and vegetable fruits and dried fruits (figs, dates, prunes, apricots, raisins, cranberries and raw nuts like walnuts, almonds, hazelnuts, pumpkin seeds, sunflower seeds are high-quality, full energy, vitamins, minerals, enzymes - fighters for the health of children. [8]. During the day they should consume a handful of these nuts and dried fruits. With daily use of these fruits provide high quality, high food only in favor of children's health [9].

3.2 Discussion

According to the results of the study with malnutrition deviations in growth was found in 0.7% of the population surveyed and moderate malnutrition in 3.3%. Overweight and obesity was found in 28.4%. From 1995 examined preschool children 5.6% were obese children. In addition, 40% of children overweight with high blood pressure, and a third of children in this group was observed the formation of fat in liver. According to data in the country, there is an increase of children who are at risk of obesity. The average values of minerals shows surplus sodium and moderate calcium deficiency intake. In the case of these children it needs to be implemented measures to supplement the diet with essential micro and macronutrients that were missing and endanger the growth and development of child [7].

The content of the food groups in the daily meal in this group shows that the average bread and pasta are presented in a daily dose of 518 g, milk and dairy products 220 g, meat 57 g, 21 g fish, eggs 23 grams, meat products 56 g, 145 g of vegetables, fruits 82 g, 20 g of butter and sugar, and concentrated to 33 grams.

Nutrition shows variability in terms of total energy per day, and there is imbalanced nutrient intake with higher intakes of fat. There is insufficient intake of fresh fruits, vegetables, fish and whole grains and sufficient intake of legumes[10].

4. Conclusions

- Disorders in the nutritional status such as malnutrition, especially position of obesity have roots in early childhood. Detection of very obese children is an alarm for enhanced preventive measures with proper guidelines for nutrition and physical activity.
- From surveyed 1995 children and malnutrition results in deviation in growth there in 0.7% of the examined population group and moderately easy malnutrition in 3.3%. Overweight and obesity which is found in 28.4%, and 5.6% are obese children.
- Daily intake of food should always be balanced, regardless of the season. The most common food (about 70%) should be carbohydrates (fruits, vegetables, pasta, bread, cereals, potatoes, chestnut, pumpkin ...) and less (15%) protein: meat, milk, dairy products, fish, eggs, soybeans, and 15% fat (the best ones in the raw seeds and nuts. well, here you have to consider whether the normal ratio of carbohydrates, protein and fat present in the diet of children-.
- Therefore it is very important to do prevention at an early childhood with proper guidance in eating habits and lifestyle and promote physical activity daily practice by young people[11]. Healthy diet family back allows proper physical and spiritual development of children and more joy and love in mutual communication and common life. From food that is fed up and functioning of the entire system, the thoughts and feelings, behavior, attitude towards the whole life and certainly health.

5. References

[1] Gjorgjev, D., Kendrovski, C., Ristovska G. Dimitrovska Z. (2008). *Food hygiene and nutrition* (in Macedonian). Ss. Cyril and Methodius University, Medical Faculty, Skopje, Macedonia.
[2] Nikolic M. (2013). *Feeding children as a pillar of public health* (in Serbian). First International Congress for hygiene and preventive medicine Proceedings, Belgrade, Serbia, pp. 436-441.
[3] Simic B. (1998). *Medical Dietetics* (in Serbian). Nauka, Belgrade, Serbia.
[4] Bogosavljev M. (1967). Physical education of children in pre-school institutions (in Serbian). ZIUSRS, Belgrade,Yugoslavia.
[5] Boskovic M. (1954). *Fundamentals of man anatomy* (in Croatian). Medical Book, Belgrade-Zagreb, Yugoslavia.
[6] Spiroski I., Dimitrov H., Gjorgjev D., Kendrovski B. (2009). *Archives of public health* (in Macedonian). Institute of Public Health of the Republic of Macedonia, Skopje, Macedonia, Vol.1, No. 1, pp. 123-133.
[7] Trajkovic J., Miric M., Baras J., Siler S. (1983). *Food analysis* (in Serbian). Technological-Metalurgical Faculty, Belgrade, Serbia.
[8] Sapuric Z. (2010). *Environment and sustainable development - regulations and policies* (in Macedonian). American Colledge, Skopje, Macedonia.

[9] Mardesic D. (2003). *Pediatrics* (in Croatian). School Book, Zagreb, Croatia.
[10] Ministry for Labor and Social policy. *Programs for education of preschool children in the institutions for children care and education, within the process of breeding and consumption of healthy food*.
[11] Iskra - Loznica. *Appropriate food for adolescents* (in Serbian).
<URL:http://www.iskra.org.rs/biblioteka_files/Pravilna_ishrana_adolescenata.pdf. Accessed 01-12-2014