


Nutritional Status and Mark on the Diet of Children Population on School Age			Healthcare Keywords: Nutritional status, risk of fattening, health enlightenment, malnutrition, normal nourishment, fattening and diet.
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Abstract			
<p>Objectives: Represent and compare the nutritional status, nutrition of children population on school age, following and prevention of malnutrition, risk of fattening and overweight of school age children. The main objective of this thesis is evaluation of the nutritional status in relation to the age of children. Additional objectives are detection of the malnutrition state or fattening as a risk of appearance of chronicle diseases. Material and methods: Thesis is a result of systematic planned gathering, analysis and interpretation of the data conducted on the national program for public health in the region of the PHI Center for Public Health- Tetovo for the period of 2012. The subject of this thesis are the children on age of 7 to 12 years, from different nationality, accidently determined from first and fifth grade in the primary schools "Bratstvo Midjeni" and "Goce Delcev", in Tetovo, Republic of Macedonia. Results: The obtained information from the evaluation of the nutritional status in correlation with the growth in the period of childhood and adolescence are declared in accordance with the analyzed parameters: mark on the relation of children age, nutritional status and mark on nutrition. Conclusion: Among the population of school children from first and fifth degree of the students from Macedonian and Albanian nationality we can conclude that half of the examined children are normally nourished, and the other part is malnourished from different degree. Among the other children is noticed fattening from different degree.</p>			

Introduction

The diet is the most important and most dynamic ecological phenomenon from which depends all stages of growth and development of the human and his evolution in biological and cultural mean and because of that we need regularly to follow and estimate how it reflects on the health status, morbidity and mortality. The realization for connection of the nutrition with the appearance of particular diseases in the older life period, such as cardiovascular diseases, hypertension, diabetes and other, demands further examinations and prevention activities in the earliest age with which timely the risk will be estimated and measures will be conducted for decrease of that risk.

Material and Working Methods

With help of the survey for children's information and evident anthropometric examinations (height and body mass), in the research were included 120 children from first and fifth grade. For evaluation of the nutritional status are used anthropological indexes (body mass index) ITM for age and estimation of growth, mass for ages, contamination of body depot of fats or % of fat tissue in the organism in accordance with recommendations of SZO for the mark of the nutrition status of children and adolescences.

Results

Table 1

Preview of children from first grade according to sex and age

Nationality	Men	Women	Total
Macedonians	17	13	30
Albanians	16	14	30

Table 2

Preview of children of fifth grade according to sex and age

Nationality	Men	Women	Total
Macedonians	16	14	30
Albanians	16	14	30

Mark on the Nutrition

Interpretation for the mass index for age is in accordance with the reference values of the mass index in relation to the age of SZO for children from 5-10 years in 2007.

Table 3

Interpretation of the BM index for children's age from 0-10 years

State	z-score	Percentage
Very little mass for age of III rd degree	<<-3SD	
Little mass for age of II nd degree	>=-3 and<-2SD	<3
Little mass on age of I st degree	>=-2SD and<-1SD	>=3 - <15
Good mass for age of I st degree	>=-1SD and<=+1SD	>= 15- <85
Bigger mass for age of Ist degree	>+1SD and<=+2SD	>85 - <=97
Bigger mass for age of II degree	>+2 and<=+3SD	>97
Bigger mass for age of III rd degree	>+3SD	

For the mass for age (mass/age), normal values are in the interval from ≥ -1 SD to $\leq +1$ SD.

In the interval from ≤ -1 SD to ≥ -2 SD is a little weight for age

In the interval is above $+1$ SD and less than $+2$ SD is bigger weight for age:

-2 SD is insufficient nutrition or nourishment

$+2$ SD fattening

Body Mass Index for Age

Bmi - Body Mass Index for Age of Children from 5-19 years

State	z-score	Percentile
Nourished from III rd degree (heavy)	<-3SD	
Nourished from II nd degree (moderate)	>=-3 and<-2SD	<3
Nourished from I st degree (bigger body mass) light	>=-2SD and<-1SD	3 -15
Good nutrition	>=-1SD and<=+1SD	>15-85
Nourished from I degree (bigger body mass) light	>+1SD and<=+2SD	85-97
Fattening from II degree (moderate)	>+2 and<=+3SD	>97
Fattening from III degree (heavy)	>+3SD	

For the body mass index for age, the normal values are in the interval from ≥ -1 SD to $\leq +1$ SD;

From <-1 SD to -2 SD easy nourishment or nourishment from I degree.

$+1$ SD and from $+2$ SD presents fattening from 1 st degree (bigger body mass)

$>+2$ SD marks as fattening from 2nd degree (moderate fattening).

<-2 SD marks as fattening from 2 nd degree (moderate fattening).

<-2 SD marks insufficient nutrition or nourishment

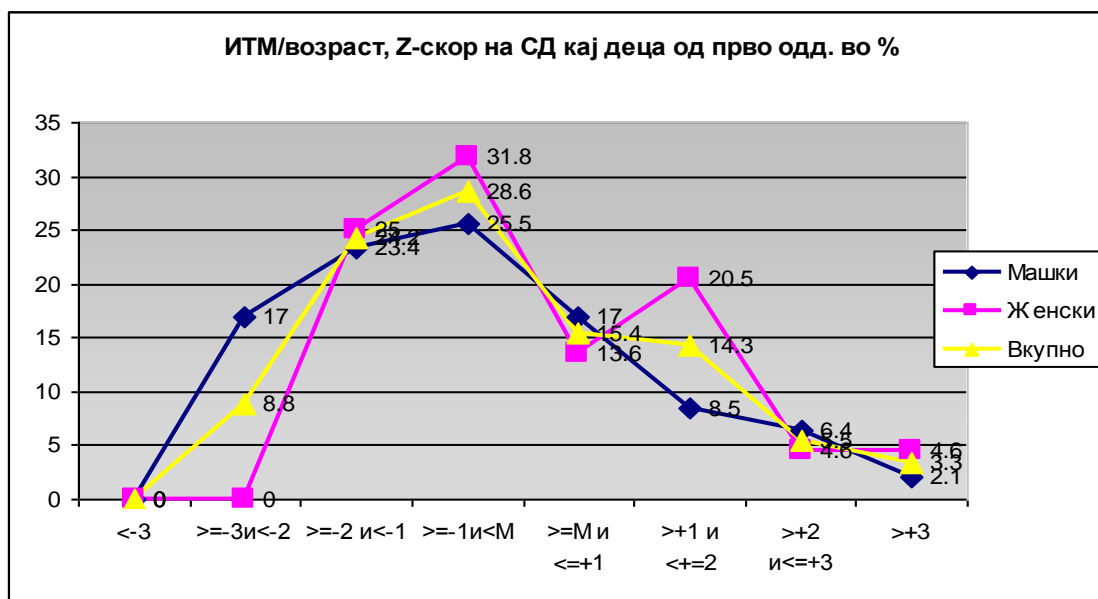
Children from the first grade

From the total number of students 44 % are normally nourished, 24, 2% are lightly nourished, 8, 8 % are moderately nourished, while there are no heavy nourished children.

14, 3 % have fattening from 1st degree, 5, 5 % have fattening from 2nd degree, while 3, 3 % have fattening of 3rd degree. There are no heavy nourished students. The difference between the sexes: 42, 5 % from male and 45.5 % from female children are lightly nourished. The moderate nourishment is presented between the male children in 17 %, and there aren't female children. There aren't heavy nourished students. For male children fattening of 1st degree in 8, 5 %, while 20, 5 % of female children have fattening of 1st degree, and fattening from 2nd degree is present between male in 6,4 %, and female children in 4,5 %.

Fattening of 3rd degree is presented between male children in 2, 1 %, and between female children in 4, 6 %.

Diagram 1



- Students from Macedonian nationality: 40 % are well nourished, 13, 3 % are moderately nourished, while there aren't the children with moderate and heavy nourishment. 30 % from Macedonian students are lightly fattened, 13, 3 % are moderately fattened and 3, 3 % are heavily fattened.
- Students from Albanian nationality: 43,3% are well nourished, 33,3 % have nourishment from 1st degree, 10 % have nourishment of 2nd degree, while there aren't students from 3rd degree.10 % from the students have fattening from 1st degree, 3,3 % have fattening of 2nd degree and 7,7 % have heavy fattening.

Among Macedonian girls 15,4 % are well nourished, 7,7 % are easily nourished, while there aren't students with moderate and heavy undernourishment.53,8 % from Macedonian students have light fattening, 15,4 % have moderate fattening and 7,7 % have heavy fattening.

Within Albanian female children 57,1 % are well nourished, 35,7 % are lightly nourished, while there aren't moderate and heavy nourished students form Albanian nationality.7,1% from the students are lightly nourished, while there aren't students with moderate and heavy fattening.Male students from Albanian

nationality 58,8% are well nourished, also 17,6% are lightly nourished, 18,7 are moderately nourished, while there aren't heavy nourished students. 12,5 % from the students are lightly fat, 6,3 % are moderately fat, there aren't heavy fat students.

Children form the fifth grade

From the total number of students 31,1 % are normally nourished, 18,9 are lightly nourished, 10 % are moderately nourished and 10 % are heavy nourished. 18,9 have fattening of 1st degree, 5,5 % have fattening of 2nd degree, while 5,5 % have fattening of 3rd degree. Concerning the difference the sexes it should emphasize that 28,3 % from the male and 34 % from female children are normally nourished, 15,2% from male and 22,7 % female children are lightly nourished. The moderate nourishment is presented between male children in 4,3%, while between female children in 15,9 %. Heavy nourished children between the male is presented in 10,9 % and between the female in 9 %. Among the male children the fattening of first degree is presented in 26 % while 11,4 % from female children have fattening from 1st degree and fattening of 2nd degree is presented among the male in 6,5 % and female children in 4,5 %. Fattening or 3rd degree is presented between male children in 8,7 % and female children in 2,3 %.

Table 5
Distribution of ITM/age for children of fifth grade by nationality

State	Albanian (No %)	Macedonian (No %)
Nourishment of 3 rd degree	8 26,7	0 0
Nourishment of 2 nd degree	2 6,7	3 10
Nourishment of 1 st degree	5 16,7	6 20
Good nutrition	9 30	8 26,7
Fattening of 1 st degree-light	5 16,7	8 26,7
Fattening of 2 nd degree-moderate	1 3,3	3 10
Fattening 3 rd degree-heavy	0 0	2 6,7

ITM/ for age among Macedonian students 26,7 % are well nourished, 20 % are lightly nourished, 10 % are moderately nourished and there isn't heavy nourished. 26,7 % from the students have light fattening, 10 % have moderate fattening and 6,7 % have heavy fattening.

Among the children from fifth degree from Albanian nationality is the following: 30 % from the children are well nourished, 16,7 % are easily nourished, 6,7 % are moderately nourished, and 26,7 % are heavy undernourished, 16,7 % have fattening from 1st degree, 3,3% have fattening from 2nd degree and fattening from 3rd is not present.

Among students from Macedonian nationality 12,5 % are well nourished, 25% are easily undernourished, 6,3 have moderate undernourished, while there aren't students with heavy undernourishment. 37,5% from the students have easy fattening, 12,5 % have moderate fattening and 6,3% have heavy fattening.

Among the male students from Albanian nationality 31,3 % are well nourished, 12,5 % are lightly nourished, there aren't moderately undernourished students, however 25 % from the students are heavy nourished. 25 % have light fattening, 6,3% have moderate fattening, and there is not a heavy fattening.

Among the female students from Albanian nationality 28,6 % are well nourished, 21,4 are lightly undernourished, as well as 14,3% are moderately undernourished and 28,6 are heavily undernourished. 7,1 have lightly fattening, while there aren't students from Albanian nationality with moderate and heavy fattening.

Among the students from Macedonian nationality 42,9 % are well nourished, 14,3 % are easily undernourished, the same 14,3 % are moderately undernourished and there aren't heavy undernourished students from Macedonian nationality. 14,3 % from the students are lightly fat, 7,1 % are moderately fat, and the same 7,1 % are heavy fat.

Discussion

According to the definition of the World Health Organization (WHO), regular diet is the one which satisfies the energetic and building needs of the organism and can provide input of protective substances which are required for the hormonal growth, development and protection. The results indicate that among the examined school population of children is presented undernourishment from moderate to heavy degree, but also is noticed light degree of fattening with immoderate to heavy degree of fattening. Because of that with recommendation of WHO of food, nutrition and prevention of chronic diseases, to malnourished children is recommended high input of food rich with energy and poor with micronutrients which contributes to increasing of the body weight. For the school children population with which is noted easy to moderate degree of fattening, in accordance with the recommendations of WHO for food, nutrition and prevention of chronic diseases is recommended prevention of fattening of children and adolescents which include the following activities: Promotion of active lifestyle, restriction in watching TV and usage of computer, increased input of fruit and vegetables, decreased input of energetic rich food and restriction of input of energy rich food and restriction of input of soda drinks and drinks with high level of sugar, restriction of exposition of children of mass marketing of energy rich food (fast food) and providing necessary information and skills for the choice of healthy food.

As part of the above mentioned, it is necessary adequate health education in which will be include and emphasized the following: necessary knowledge for healthy food, motivation, healthy habits. From healthy ecological aspects of food and diet it is required to emphasis on: the strategy for healthy diet, prevention of diseases related with irregular diet, planning of the diet, schedule of the daily meals, and content of the daily meals.

Anthropometry is especially important during the childhood and adolescence because enables monitoring and evaluation of the hormone conducted changes in the growth and maturation in this life period. Even more the growth can be sensitive on the nutritional deficit and surplus. Adolescence anthropometry provides indicators for nutritional status and healthy risk and can diagnose malnutrition state or fattening state which are substantially conditioned by the unhealthy diet and lifestyle. The unhealthy life style acts in the early phases of the life cycle and provides early development of obesity, disorder of the lipid status in relation to the level of triglycerides HDL and LDL, cholesterol, disorder of the function of the pancreas and etc. The state of fattening as complex multifunctional disorder is one of the important causes of interrupted health and there is increased risk for the development of particular diseases, such as diseases of the cardiovascular system, interrupted circulation, appearance of malignity diseases and other non fatal, but states of diseases which have direct influence of the quality of life which is formed in the early childhood.

Conclusions

Through the analyses of BMI of the students of first degree from Macedonian and Albanian nationality we can conclude that from the total number of students

44 % are normally nourished, 24, 2 % are easily nourished 8, 8 % are moderately nourished, and there aren't heavy nourished students, 14, 3% have fattening from 1st degree, 5, 5 % have fattening from 2nd degree and 3, 3 % have fattening from 3rd degree.

Through the analyses of BMI of students from fifth grade from Macedonian and Albanian nationality we can conclude that from the total number of students, 31, 1 % are normally nourished, 18,9 % are lightly nourished, 10 % are moderately nourished, 10 % are heavy nourished, 18,9 % have fattening from 1st degree, 5,5 % have fattening from 2nd degree and 5,5 % have fattening from 3rd degree.

During the analyses of the nutritional degree of the students of first grade from different nationalities we saw that students from Macedonian nationality 40 % are well nourished, 13, 3% are moderately nourished, while there aren't children who are moderately and heavy nourished. 30 % from the Macedonian students are easily nourished, 13.3 % are moderately nourished and 3, 3 % have heavy fattening.

From the total number of students from Albanian nationality 43, 3 % are well nourished, 33, 3 % have undernourishment from 1st degree, 10 % have undernourished from 2nd degree, while there aren't undernourished students from 3rd degree. 10 % from the students have fattening from 1st degree, 3, 3 % have fattening from 2nd degree and there aren't students with fattening of 3rd degree.

The mark on nutrition among the students from fifth degree from different nationality has shown considerable difference. It is noted that ITM/ for children's age of fifth degree among the children from Macedonian nationality is the following: 26, 7 are well nourished, 20 % are easy nourished, 10 % are moderately nourished and there aren't heavy nourished students. 26, 7 % from the students have light fattening, 10 % have moderate fattening and 6, 7 have heavy fattening.

Among the children of Albanian nationality is the following: 30 % from the children are well nourished, 16,7 % are easily nourished, 6,7 % are moderately nourished, 26,7 % are heavy nourished, 16,7 % have fattening from 1st degree, 3,3 % have fattening from 2nd degree, and fattening from 3rd degree isn't present.

During the analyses of the examined between different nationality from fifth grade relating to the sex, it is considered that among male sex there is a biggest number of students from Albanian nationality and that for 6, 2 % in relation to the Macedonian students, while fattening is most presented among Macedonian students and that 50 % more in relation to the Albanian students.

Among female students from fifth degree it is noted that the most nourished students have from Albanian nationality and that 35, 7 % more than Macedonian children, while most fat students have among girls from Macedonian nationality and that for 21,4% more in relation to the Albanian girls.

References

1. De Onis M. The use of anthropometry in the prevention of childhood overweight and obesity. *Int J Obes Relat Metab Disord* 2004;28:S81-5.
2. Димитровска Златанка и др. Нутритивна Атропометрија: мерења, индикатори, индекси, нутритивен статус.(2 дополнето издание). Републички завод за здравствена заштита, одделение за хигиена на исхрана. Скопје; 2006 г.
3. Dimitrovska Z, Spiroski I, Gudeva-Nikovska D, Kendrovski, V, Aleksoski B. Prevalence of overweight and obesity in children and adolescents in Macedonia. *Abstract book of the 2nd Balkan Congress on Obesity* 2006 May: 96.WHO. Child Growth Standards. Backgrounder 1. 27 A
4. Gjorgjev D, Vacanovic A, Cicevalieva S, Sulevski Z, Grosse-Tebbe S. The Republic of Macedonia: Health system review. *Health Systems in Transition* 2006; 8(2):11.
5. Симич Божидар: Медицинска Дијететика. Београд; 1998 г.
6. Светска здравствена организација. СИНДИ-Прирачник за правилна ихрана на населението во Европскиот Регион на СЗО. 2000 г.

7. Светска здравствена организација. Храна, исхрана и превенција на хроничните заболувања. Женева; 2003 г.
8. Закон за безбедност на храната и на производите и материјалите што доаѓаат во контакт со храната (Сл. Весник на РМ бр.54 / 02).
9. Невена Цветанова, Персида Малинска, Здравствено воспитание
10. Нутритивна антропометрија: мерења, индикатори, индекси, нутритивен статус (Азис Положани и др.)
3. Дополнето и проширено издание, Скопје Институт за јавно здравје 2009 г.
11. Елисавета Стикова, Здравствена Еклогија, Универзитет “Свети Кирил и Методиј” Скопје 2006 г.