Nutritional Status of Lithuanian Lowland Children and Youth

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The aim of the present work was to study the nutritional status of Lithuanian Lowland schoolchildren and youth. In 1998–1999, 2274 Lowland children (1108 boys and 1166 girls) aged 7 to 18 years were examined by standard anthropometrical methods. The investigation was carried out in Klaipėda district schools. Nutritional status of schoolchidren and youth was evaluated according to the M. Möhr methods.

The study subjects were divided into three main groups depending on their body weight: normal, underweight, overweight. The weight was considered normal, if it differed by –10% to +9% from the optimum.

The results revealed 68.3% of boys and 57.8% of girls to be of normal weight, 16.1% of boys and 23.0% of girls to be underweight, and 15.6% of boys and 19.2% of girls to be overweight.

In the pubertal growth peak the weight dropped down, and the number of underweight children increased. This fact can be explained by the peculiarities of pubescence.

The number of overweight girls was found to increase with age.

Key words: children and youth, anthropometry, nutritional status

INTRODUCTION

The body weight index is one of those most labile in children. Its genetical program limits are broad; therefore the weight index undergoes changes depending on the social and economical conditions, age, gender, nutrition; last but not least, psychological factors play a role, too (1).

Obesity often has its source in childhood. As some authors report, no less than one third of overweight adults become obese in childhood. The degree of obesity keeps increasing with age (1–3).

Since in most cases obesity is of alimentary-exogenous nature, there are two major ways to escape the risk of danger caused by obesity. These are implementation of healthy nutrition principles and the physical activity of schoolchildren (5–7).

The nutritional status of Lithuanian Highland schoolchildren has been studied by us earlier; however, no data are available on the nutrition state of Lithuanian Lowland schoolchildren. The aim of the present work was to fill in this gap.

MATERIALS AND METHODS

The anthropometrical investigations were carried out in 1998 and 1999 and embraced 2274 Lowland schoolchildren (1108 boys and 1166 girls) of the Veiviržėnai and Gargždai secondary schools (Klaipėda district). The age of the schoolchildren was 7 to 18 years (Table 1). Standard anthropometrical methods of examination were applied (8, 9).

The nutritional status of schoolchildren was evaluated by the methods elaborated by M. Möhr (10). To evaluate the weight and to determine a relation between weight and health, of greatest importance

Table 1. **The study cohort**

Age, years	Boys	Girls	Total
7	35	34	69
8	131	94	225
9	70	84	154
10	96	78	174
11	100	91	191
12	138	95	233
13	109	93	202
14	106	97	203
15	112	147	259
16	86	162	248
17	60	105	165
18	65	86	151
Total	1108	1166	2274

is a correct weight/hight ratio. While determining the level of physical development of a child, we should see if the child's height corresponds to his/her age and the weight to the height. This is the background of M. Möhr's methods.

Depending on their body weight the study children were divided into three main groups: normal, under- and overweight. The weight was considered normal, if it differed from the optimum level by – 10% to +9%. The underweight group was subdivided into three subgroups: 1) slight thinness, with body weight by 11% to 20% less than the optimum; 2) severe thinness, with body weight differing from the optimum level by –21% to –30%; and 3) very severe thinness, with body weight –30% below the optimum level. The overweight group was divided into five subgroups: 1) 10% to 19% above the optimum level – slight obesity; 2) 20% to 29% – moderate obesity; 3) 30% to 39% – mean obesity; 4) 40% to 49% – severe obesity; and 5) more than 49% above the optimum weight – very severe obesity.

RESULTS AND DISCUSSION

Tables 2 and 3 present data on body weight for each age separately and, for the sake of clearness, by three age groups (7–10, 11–13 and 14–18 years) which differ in growth tempos related with pubescence peculiarities (Table 4).

The results revealed 68.3% of boys, schoolchildren of 1st to 12th classes, and 57.8% of girls to be of normal weight, 16.1% of boys and 23.0% of girls to be underweight, and 15.6% of boys and 19.2% of girls to be overweight (Table 5).

In the age group of 7–10 years, 70.2% of boys and 58.3% of girls were of normal weight, 13.8% of boys and 26.5% of girls underweight, and 16.0% of boys and 15.2% of girls overweight.

In the age group of 11–13 years, 63.1% of boys and 51.3% of girls were found to be of normal weight, 21.3% of boys and 31.9% of girls were underweight and 15.6% of boys and 16.8% of girls overweight.

In the age group of 14–18 years, 71.1% of boys and 60.6% of girls were of normal weight, 13.5% of boys and 17.1% of girls were underweight and 15.4% of boys and 22.3% of girls overweight.

Analysis of the age-related dynamics of the body weight groups showed that with age the number of normal weight children decreased and that of underweight children increased. Their relation underwent distinct changes at the age of 11–13 years. The group of normal weight children decreased by 7.1% ($p = 0.05$), and the underweight group increased by 7.5% ($p = 0.01$). This fact can be explained by pubescence peculiarities. It is the age when the pubertal growth leap occurs; however, different parts of the body change their size at different time and at different tempos. The height grows most strikingly, therefore children look spindle-shanks, their weight does not keep up with their height (9).

The relative weight groups in boys aged 14–18 years were similar to those of boys aged 7–10 years, because differences were insignificant and statistically unreliable. Relative weight groups in girls aged 14–18 years differed from those of girls aged 7–10 years. The normal weight group slightly increased (by 2.3%, $p > 0.1$), the underweight group decreased by 9.4% ($p=0.01$), and the overweight group increased by 7.1% ($p = 0.01$).

Among the Lowland schoolchildren involved in our study there were more thin girls than thin boys (Table 6). The difference reached 6.9% ($p = 0.001$).

Table 2. **Relative weight groups of Lowland boys (%)**

Age, years	Very severe thinness	Severe thinness	Slight thinness	Normal weight	Slight obesity	Moderate obesity	Mean obesity	Severe obesity	Very severe obesity
7	–	–	8.6	74.3	14.3	2.8	–	–	–
8	–	0.8	6.1	78.6	9.9	3.8	–	–	0.8
9	–	1.4	21.4	61.4	7.1	2.8	2.8	1.4	1.4
10	–	2.1	16.7	63.5	11.4	4.2	–	–	2.1
11	–	3.0	19.0	60.0	12.0	3.0	2.0	1.0	–
12	–	2.9	15.2	67.4	8.7	2.2	2.2	1.4	–
13	0.9	0.9	22.9	60.5	7.3	2.7	2.7	0.9	0.9
14	–	0.9	18.9	68.9	9.4	0.9	0.9	–	–
15	–	–	16.1	72.3	7.1	1.8	0.9	1.8	–
16	–	–	10.5	79.1	9.3	–	1.2	–	–
17	–	1.7	10.0	71.7	13.3	–	1.7	1.7	–
18	–	–	4.6	61.5	23.1	4.6	–	4.6	1.5
Total	0.1	1.3	14.7	68.3	10.4	2.4	1.3	1.0	0.5

Table 3. **Relative weight groups in Lowland girls (%)**

Age, years	Very severe thinness	Severe thinness	Slight thinness	Normal weight	Slight obesity	Moderate obesity	Mean obesity	Severe obesity	Very severe obesity
7	–	2.9	26.5	47.0	14.7	2.9	5.9	–	–
8	–	3.2	14.9	62.8	10.6	5.3	1.1	1.1	1.1
9	–	9.5	26.2	53.6	7.1	1.2	1.2	–	1.2
10	1.3	1.3	23.1	62.8	9.0	2.5	–	–	–
11	1.1	7.7	28.6	43.9	11.0	5.5	–	1.1	1.1
12	–	6.3	28.4	53.7	6.3	1.0	3.1	–	1.0
13	–	3.2	20.4	55.9	8.6	4.3	7.5	–	–
14	–	9.3	22.7	55.7	6.2	6.2	–	–	–
15	–	2.7	17.0	59.9	15.6	3.4	–	1.4	–
16	–	1.2	14.8	60.5	14.8	3.1	3.7	1.2	0.6
17	–	0.9	6.7	70.5	12.4	7.6	1.9	–	–
18	–	–	9.3	55.8	16.3	15.1	2.3	1.2	–
Total	0.2	3.8	18.9	57.8	11.3	4.8	2.0	0.6	0.4

Table 4. **Relative weight groups of schoolchildren according to pubescence phases (%)**

Age, years	Very severe thinness	Severe thinness	Slight thinness	Normal weight	Slight obesity	Moderate obesity	Mean obesity	Severe obesity	Very severe obesity
				Boys					
7–10	–	1.2	12.6	70.2	10.2	3.6	0.6	0.3	1.2
11–13	0.3	2.3	18.7	63.1	9.2	2.6	2.3	1.2	0.3
14–18	–	0.5	13.1	71.1	11.4	1.4	0.9	1.4	0.2
				Girls					
7–10	0.3	4.5	21.7	58.3	9.6	3.1	1.4	0.3	0.7
11–13	0.3	5.7	25.8	51.2	8.6	3.6	3.6	0.3	0.7
14–18	–	2.7	14.4	60.6	13.4	6.2	1.7	0.8	0.2

Table 5. **Nutritional status of schoolchildren depending on their pubescence phases (%)**

Age groups	Medium	Thin	Obese
	Boys		
7–10	70.2	13.8	16.0
11–13	63.1	21.3	15.6
14–18	71.1	13.5	15.4
Total	68.3	16.1	15.6
	Girls		
7–10	58.3	26.5	15.2
11–13	51.3	31.9	16.8
14–18	60.6	17.1	22.3
Total	57.8	23.0	19.2

Table 6. **Groups of thin children according to pubescence phases (%)**

Age groups	Severy and very severe thinness	Slight thinness	Total of thin children
	Boys		
7–10	1.2	12.6	13.8
11–13	2.6	18.7	21.3
14–18	0.5	13.0	13.5
Total	1.4	14.7	16.1
	Girls		
7–10	4.8	21.7	26.5
11–13	6.1	25.8	31.9
14–18	2.7	14.4	17.1
Total	4.1	18.9	23.0

Thinness in most of them was insignificant and caused no distinct problems.

Besides, with age a tendency to an increased number of obese children became pronounced (Table 7), more among girls than boys. However, the degree of obesity in most of them was not high. Of all the schoolchildren studied, obesity was distinct or striking only in 1.5% of boys and 1.1% of girls.

Table 7. **Groups of obese children according to pubescence phases (%)**

Age groups	Slight obesity	Mean	Severe and very severe obesity	Total of obese children
			Boys	
7–10	10.2	4.2	1.6	16.0
11–13	9.2	4.9	1.5	15.6
14–18	11.5	2.3	1.6	15.4
Total	10.4	3.7	1.5	15.6
			Girls	
7–10	9.6	4.5	1.1	15.2
11–13	8.6	7.2	1.0	16.8
14–18	13.4	7.9	1.0	22.3
Total	11.3	6.8	1.1	19.2

CONCLUSIONS

1. Among the Lowland schoolchildren (age 7–18 years) studied, 68.3% of boys and 57.8% of girls were of normal weight, 16.1% of boys and 23.0% of girls were underweight, and 15.6% of boys and 19.2% of girls were overweight.

2. Body weight was behind the height in children in their pubertal growth leap period, and the number of underweight children in this age group was rather high.

3. The overweight groups in girls showed a tendency to increase with age.

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A. Adomaitis

ŽEMAIČIŲ VAIKŲ IR JAUNUOLIŲ ĮMIČIO BŪKLĖ

Santrauka

Šio darbo tikslas – ištirti žemaičių mokyklinio amžiaus vaikų ir jaunuolių įmičio būklę.

1998 ir 1999 metais antropologiškai ištyrėme 2274 žemaičių vaikus Klaipėdos rajono mokyklose (1108 berniukus ir 1166 mergaites). Jų amžius 7–18 metų imtinai. Tyrimams taikyta standartinė antropometrijos metodika.

Mokinių įmitis buvo vertinamas pagal M. Möhr pasiūlytą metodiką.

Pagal kūno svorį mokinius suskirstėme į 3 pagrindines grupes: normalaus, per mažo ir per didelio svorio. Normaliu laikomas svoris, svyruojantis nuo –10 iki +9% abipus optimalaus svorio.

Gauti rezultatai parodė, kad iš I–XII klasių žemaičių mokinių 68,3% berniukų ir 57,8% mergaičių yra normalaus svorio, 16,1% berniukų ir 23,0% mergaičių – per mažo, 15,6% berniukų ir 19,2% mergaičių – per didelio svorio.

Pubertetinio augimo šuolio metu pagausėja nepakankamai sveriančių vaikų. Tai paaiškinama lytinio brendimo ypatybėmis.

Per didelio svorio mergaičių grupės amžiui didėjant didėja.

Raktažodžiai: vaikai ir jaunuoliai, antropometrija, įmičio būklė