



Hungarian Dimensions of Physical Activity Based on Studies at School Ages

Bence CSELIK¹, Márta SZMODIS²,
Gábor SZÓTS³, Pongrác ÁCS⁴

cselik@icwip.hu

(^{1, 4}University of Pécs, Faculty of Health Sciences, Pécs,
Hungary;

^{2, 3}Semmelweis University Faculty of Physical Education and
Sports, Budapest, Hungary)

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Abstract: *It is an old pursuit to find the balance between nature and society (within the individual and the sum of people). In order to talk about a healthy society, it is necessary to have the people making up the society healthy too. The health condition of the individuals affects the society, creating a close connection among individuals and society. Health, mental and physical well-beings of members of society affects the economy, since a healthy workforce leads to developing economy, which hence can provide the requirements and conditions that ensure a mentally and physically healthy way of living for the society. Sport, everyday exercise, therefore regular training can also play an important social role, and can greatly contribute to social well-being. Decreased physical activity, sitting lifestyle are both specific traits of economically developed countries, and turns into a more and more threatening public health problem world-wide, which contribute to the development or aggravation of such chronic diseases and health damages, like morbid obesity, heart diseases, diabetes, hypertension, locomotor diseases, malignant tumors, depression. The topic of our research is related to mainly the subject of primary school healthcare programs. The measurements have been taken in 12 different educational institutions, which included primary, secondary, vocational schools, and a 6-grade school. The actuality of the topic is proven by the increased obesity appearing at more younger ages, and we intend to shed some light on the fact, that with a good healthcare strategy and short-term goals we can achieve positive results shortly on the fields of school healthcare.*

Keywords: health education, physical education, activity, childhood

Theoretical background

In the developed countries, and so in Hungary, for decades it has been specific – also for the developing countries nowadays – that the civilizational diseases have increasing prevalence, and happen to appear at even earlier ages. Among the factors of lifestyle – which researches proved to have a 40% role within the development of diseases – the lack of regular physical exercises is significant (Szóts, 2012).

A survey taken by Eurobarometer in 2010 in Hungary, shows that 77% of the population can be considered practically inactive, since they do not exercise more than 3 times monthly. This is a highly unacceptable rate. While 53% of Hungarians never do any regular exercise, the European average is 37% (Ács et al., 2011). We are facing a global, world-wide problem, which causes serious damages on an international level, threatens the future of communities and families, and worsens the affected people's living conditions and prospects of living (WHO, 2010).

The National Children Healthcare Institution took a survey in 2009 in cooperation with the HBSC international research, examined the physical and free-time activity of 5th, 7th, 9th and 11th grade students. Only 17.3% of children does enough exercise (rate of boys and children belonging to younger age groups are significantly higher), 30.7% of them does little, and 34.5% spends very little time for physical exercises (rates get higher with the ages going onwards). Based on international proposals – at least 1 hour moderate exercise a day – less than 20% of Hungarian children does enough trainings, which is a medium result compared to international achievements. It can be told, that 2 out of 3 students does intensive exercise at least twice a week, whilst at least 2 hours per week dynamic exercise was not observed even at the half of the students (HBSC, 2009).

The regular and health-centered examination of children and adolescents has a long and significant history, because the records of their actual conditions not only reflects the health of an entire, growing up generation, but in case meeting with the proper requirements, it can describe the health of the upcoming adult population, therefore it can serve as guide for the governments, in order to show what kind of further actions need to be taken.

Objectives

Introduce the general health conditions, attitude toward physical activities and health of students from the primary and secondary schools included in our research, which is realized within the secondary social environment of the children, right after the family itself.

Give information about the measurements, their results based on the anthropometric measures, tests, and other questionnaires.

Get to know the possibilities of operational planning, leading to the strategic goals, empirical basis of describing short-term goals. To show, that the success of every strategy-like work depends on the engagement and attitude of participants too.

To prove, that our every future goal can be achieved only with step-by-step method, constant feedbacks and reviews, and it is also important to compare with similar measures, in order to place ourselves in the right position.

Probative hypotheses

We assume that the healthcare education of children starts in primary school, and that a good and committed healthcare workteam and program can cause positive changes in the health condition and perception of health of the individuals in each institution.

With the constant review of the results, and follow-up studies, it is possible to create a good health program in each institution.

We also assume, that by the progress of the ages of individual, the rate of physical activity decreases, furthermore some anthropometric, exercise and health condition related data will worsen by natural causes. In addition, we think that a good health program that was well-tried in one primary institution, can be successfully involved into another – not necessarily primary – educational institution.

Resource and method

During the selection of the sample, we have taken into consideration not only the rate of ages and genders, but the administrative units of the country (capital, regions), economic-geography relations, the four categories of town by size (cities with population lower than 1000, within 1000 and 10,000, within 10,000 and 100,000, and above 100,000), type of school and the different social-economic statuses.

The subjects of the study were picked from primary and secondary schools of Budapest, Budakeszi, Alsónémedi, Tata, Kecskemét, Sopron, Pécs and Nyíregyháza, or from town within the catchment area of the above mentioned cities.

The total sample (N = 3402), included 7–18 yrs old boys (n = 1683) and girls (n = 1697), among those who filled only questionnaires, 22 did not select any gender type (1. table).

1. table. Rate of examinees by gender and decimal ages (n=3402)

| Age categories | Age (year) | Sex | | | | | | | |
|----------------|------------|------|-------|------|-------|---------|------|-------|--------|
| | | Boy | | Girl | | no data | | sum.: | |
| | | N | % | N | % | N | % | N | % |
| 6,50-7,49 | 7 | 66 | 1.9% | 80 | 2.3% | 0 | 0.0% | 146 | 4.3% |
| 7,50-8,49 | 8 | 124 | 3.6% | 119 | 3.5% | 0 | 0.0% | 243 | 7.1% |
| 8,50-9,49 | 9 | 119 | 3.5% | 120 | 3.5% | 0 | 0.0% | 239 | 7.0% |
| 9,50-10,49 | 10 | 127 | 3.7% | 120 | 3.5% | 0 | 0.0% | 247 | 7.3% |
| 10,50-11,49 | 11 | 128 | 3.8% | 125 | 3.7% | 1 | 0.0% | 254 | 7.5% |
| 11,50-12,49 | 12 | 162 | 4.8% | 138 | 4.1% | 1 | 0.0% | 301 | 8.8% |
| 12,50-13,49 | 13 | 132 | 3.9% | 181 | 5.3% | 0 | 0.0% | 313 | 9.2% |
| 13,50-14,49 | 14 | 147 | 4.3% | 141 | 4.1% | 0 | 0.0% | 288 | 8.5% |
| 14,50-15,49 | 15 | 137 | 4.0% | 145 | 4.3% | 0 | 0.0% | 282 | 8.3% |
| 15,50-16,49 | 16 | 179 | 5.3% | 173 | 5.1% | 4 | 0.1% | 356 | 10.5% |
| 16,50-17,49 | 17 | 147 | 4.3% | 136 | 4.0% | 1 | 0.0% | 284 | 8.3% |
| 17,50-18,49 | 18-18+ | 116 | 3.4% | 113 | 3.3% | 1 | 0.0% | 229 | 6.8% |
| no data | | 99 | 2.9% | 107 | 3.1% | 14 | 0.4% | 220 | 6.5% |
| sum.: | | 1683 | 49.5% | 1697 | 49.9% | 22 | 0.6% | 3402 | 100.0% |

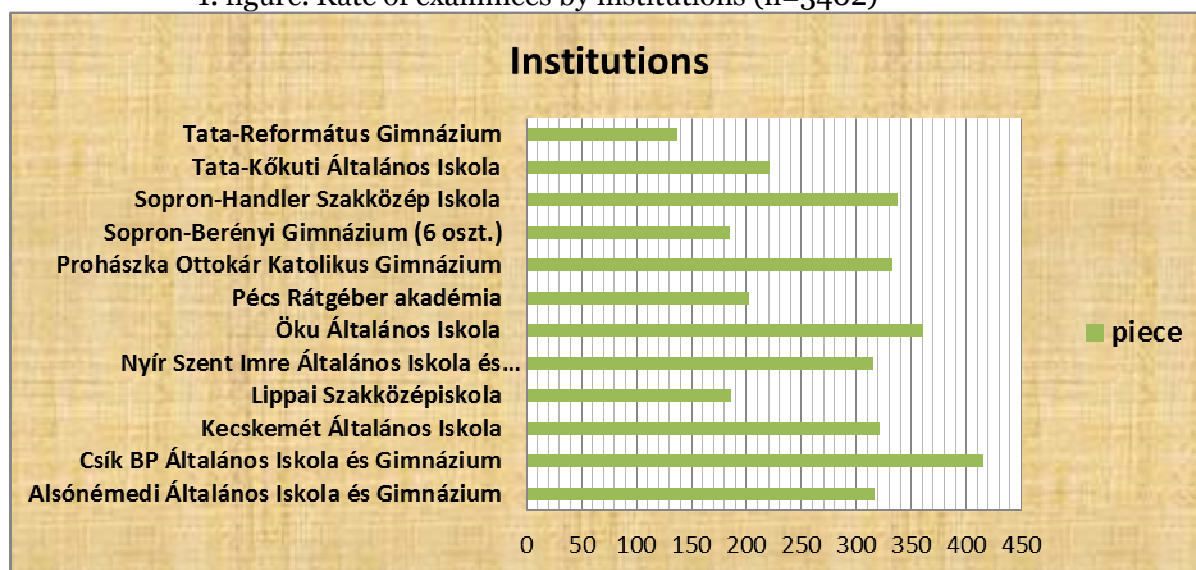
Source: own edition, based on research results

The participation in the research was voluntary, took place with reversible anonymity and written parental permission (in case of adults, the written permission of examinee was needed) and prior informations, in align with the requirements of Helsinki Declaration.

In the compound research, children took part as per the given questions, in align with the random sample selection process.

Youth taking part in the study have been separated based on five different form of school system. Lower grades for 1st-4th grades, Upper grades for 5th-8th grades, secondary schools for 9th-12th grades, whilst the vocational school members were also made out of 9th-12th graders, and with 13th-14th graders in some cases (1. figure).

1. figure. Rate of examinees by institutions (n=3402)



Source: own edition, based on research results

Based on the paragraph of the law about the national public education (2011. CX. law 45. § (3)) education is compulsory until the date the student fulfills his 16 years old age, and is introduced in an ascending system: those students, who started their 9th grade studies in 2011/2012, they are obligated to study until that educational year, in which they turn 16.

Taking into consideration this really important age on an educational aspect, 25.58% of the interviewed belong to those group age (above 16), which will no longer be obliged to study at this age.

The anthropometric measures within our research have been taken in align with the proposals described by the International Biology Program, with devices approved by the international standards. (Weiner és Lourie, 1969). Based on the measured informations, we estimated the children's nutritional conditions (Body Mass Index, BMI), and body composition. In addition to these, we have had the students to complete different track tests, motoric tests.

Describing the used data-gathering method

Children filled out the questionnaires (mostly made out of closed questions) with the help of their parents, based on the children's ages, codes marking the anonymity and comparability were also indicated on the sheets.

The 'Social-demographic survey' intended to examine the social and economic conditions.

We examined the sporting habits, spending of free-time, well-being and health with the help of 'Physical activity survey' (Currie et al., 2012).

Eating habits, and the frequency of different food consumption (Hungarian adaptation of Food Frequency Questionnaire), diet, consumption of cigarette and alcohol were all examined by the 'Nutrition questionnaire'.

The questions alternately relate to the topics of health, nutrition, sport, and willingness to sport. It also eludes on eating habits, and we were curious about the individual opinions with specific topic (e.g. what do they think about their own health condition, what is their eating habit like, or how do they feel about themselves).

Describing statistical tries, and variables

For the statistical analysis, we have used the IBM SPSS Statistics Version 20 and Microsoft Excel 2010 softwares.

We ensured the normal dispersion of the sample based on the One-Sample Kolmogorov-Smirnov Test.

In case of the parametric variables we used a two-samples *t*-try, Pearson linear korrelation-analysis and variance-analysis (F-test, Tukey Post-Hoc test), and in case of non-parametric variables Mann-Whitney U-test, χ^2 -try, Kruskal-Wallis test, Spearman korrelation-analysis was used. The level of significance was $p < 0,05$.

Based on the above, we have identified the calculated the average and dispersion of the measured anthropometric and track test datas, and had a closer look on what significant differences can occur between different groups (gender, school types, age groups etc.).

If we examine the different results based on genders, the normal dispersion of the sample was checked based on the One-Sample Kolmogorov-Smirnov test, which tells us that the sample does not follow the normal dispersion. ($p > 0,05$).

In this case it is justifiable to use the non-parametric Mann-Whitney Test, since we talk about two different groups in case of genders.

Differences based on school type and ages the sample follows the non-normal dispersion ($p > 0,05$), based on the One-Sample Kolmogorov-Smirnov Test. In this case it is justifiable to use the non-parametric Mann-Whitney Test, since we talk about several different groups based on school types and age.

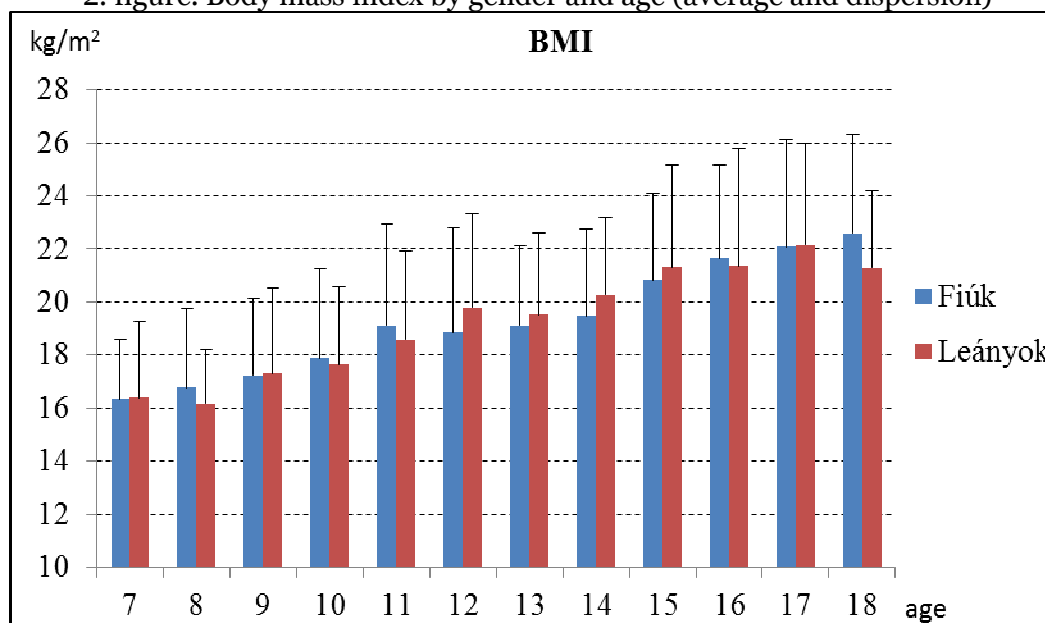
Results

From the anthropometric examination of children, we will introduce the variation of body sizes based on age and gender; furthermore the results only connected with health and lifestyle, especially those directly related with regular physical activities.

The general body mass index among 7-13 yrs old boys is significantly lower, that boys from older ages. The average results by age-groups among girls show highly different results until the age of 14.

17 yrs olds have significantly different results than those at nearby age-groups. This statement might be relevant only to this case. The difference among genders was not remarkable, except the 18 yrs old groups (2. figure).

2. figure. Body mass index by gender and age (average and dispersion)

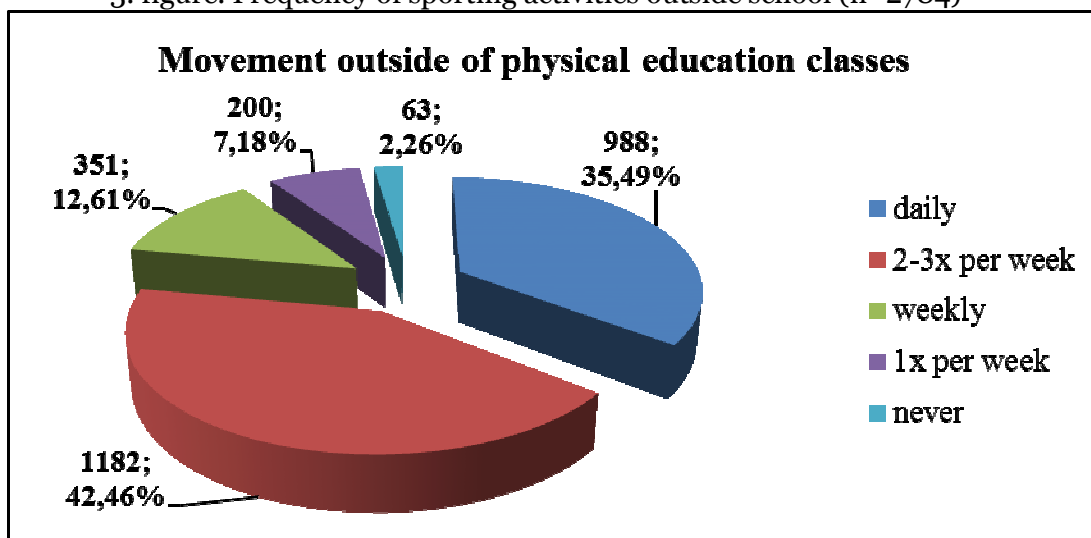


Source: own edition, based on research results

One of the most significant aspect of the research is related with sports, and the participants' willingness toward sport. Out of the respondents, 1915 people (908 girls and 997 boys) answered with yes for the question, do they any kind of sporting activities outside of class? This is 70.12% of the 2731 respondents, therefore we can state, that more than 2/3 of the children do active sport outside P.E. classes. Certainly we can involve here the after class activities of the school, because the question only focused on those activities that are not compulsory.

Examining the students' sporting activities outside of the school system, it can be described by the response of 2784, that almost half of the students do sporting activities outside of school at least 2-3 times a week (3. figure). The second most frequent answer was the daily level sporting, which can be a reason for optimism. In case we relate these two informations, we can say that 77.95% of the examined children does some sort of physical activity at least 2-3 times a week. If this data meets with quality exercises and nutrition, than we can talk about a sample potentially described as healthy lifestyle. Only 2.26% of respondents answered with „I almost never do sport”.

3. figure. Frequency of sporting activities outside school (n=2784)



Source: own edition, based on research results

The measurement took place in 2013, within the 2012/13 school year, therefore the students of 1st., 5th and 9th grade were involved into the daily p.e. educational classes.

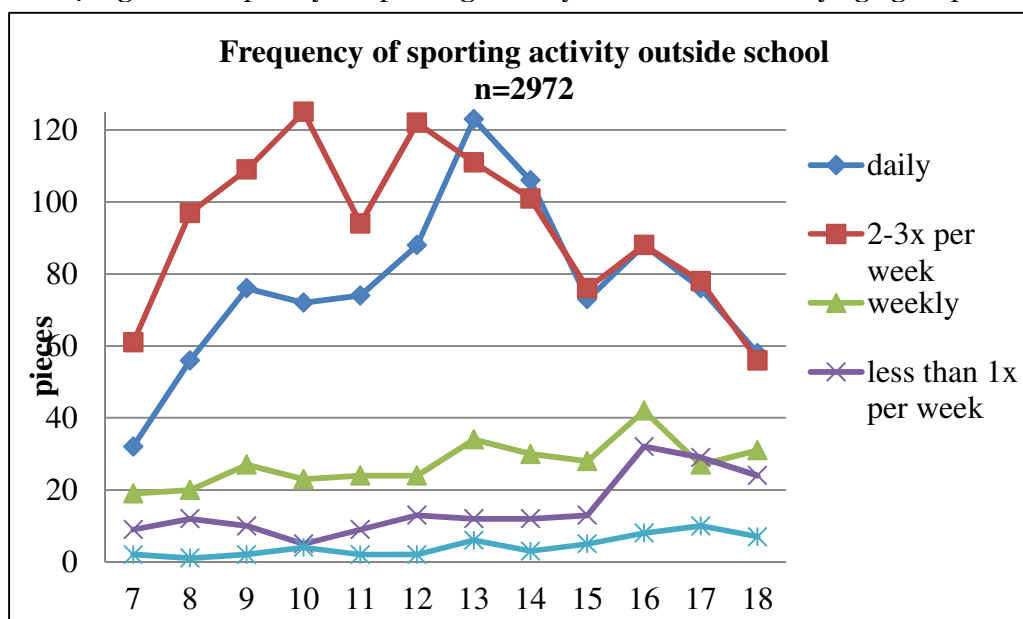
Based on age categories (by decimal ages) most of the 7-8, 10-12, and 14-16 yrs old were involved. Based on this, we experienced a smaller willingness toward sporting activities among the 7-8 yrs olds, however at this age it can easily be the parents, who think that it is sufficient for their children at this age to participate in sporting activities only on p.e. classes on a daily level. The 10-12 yrs old children can be considered very active. Among the different age groups, they are more likely to do sporting activities at least 2-3 times a week outside of school, however within the 11 yrs old group (which is the equivalent for the majority of 5th graders) we can see a bigger decrease in relation with the daily and weekly sporting outside of school.

Those involved in the survey, the 13 yrs old show the biggest willingness toward sport, older than this age this tendency started to decrease slowly. We saw a higher level of decrease within the sporting activities on a daily and 2-3 a week levels at the age of 15 – so the majority of the 9th graders. The daily-level p.e. class has a major effect on the students' willingness to sporting activities, the affected age groups took less and less sporting activities outside of classes.

It is conceivable, that both parents and students believe, that 5x45 mins a week is sufficient enough for preventive healthcare.

During the research we have not asked about which student received exemption from the p.e. classes, since those who obtain a membership for a sport club, they can apply for such exemption (4. figure).

4. figure. Frequency of sporting activity outside school – by age groups



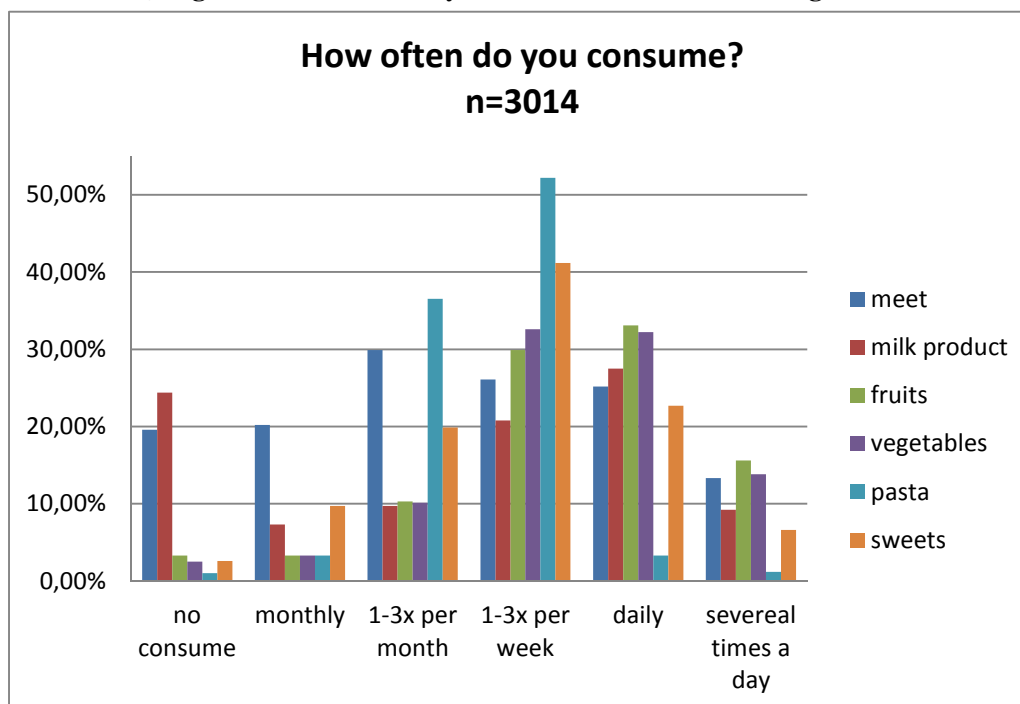
Source: own edition, based on research results

During the questionnaire we intended to gather information about the students' eating habits, especially about the frequency of consuming certain foods. For the sake of easier processability, we conducted the analysis by food types, using the following, general categories:

- dairy products, eggs
- meat
- complex carbohydrates
- beverages
- fast food
- fruits, vegetables
- sweets

For the reason that children from primary schools are involved, their eating habits can be greatly affected by the range of meals included in the public catering within educational institutions (5. figure).

5. figure. How often do you consume the below categories?



Source: own edition, based on research results

The measurement reveals that students consume fruits, vegetables, meats and dairy products the most. From the aspect of dairy products, 27.5% of participants consume at least once a day. Half of the students eat at least once a day some sort of fruits and/or vegetables, which is accompanied with meat consumption with the rate of more than 30% of total respondents.

However, it is premonitory, that 29.4% of students are affected with the daily use of sweets, but we can see that in most of these cases children do physical activity on a daily level.

Discussion and conclusion

Based on the body mass index results only 25% of children can be described as overweight or obese, which corresponds to other, previous in-country results. However, only 7% of children obtained higher than 30% body fat rate, which is less than the most up-to-date Hungarian researches.

The beneficial effects of regular sporting on Hungarian children and adolescents is also proven by us, such examination have never been conducted in Hungary.

Based on the survey of National Children healthcare Institution (OGYEI) conducted a decade ago, 28% of the students consumed fruits on a daily level, which rate decreased as the pupils got older, with more significant decrease in case of boys. In our cases it is clearly shown, that the mixed, diverse nutrition appears in the everyday life of students.

Physical activity is highly affected by gender and age, our results were similar what was in the OGYEI-HBSC survey (Németh, 2007), which shows how regular physical activity decreases ages got older, until an

insufficient level, and this is mostly applicable to girls. However within our examined samples, children who do not, or rarely do sports, are presented at a very low number.

It can be told from the survey, that we managed to achieve positive results within the fields of nutritional and exercising habits. Mixed, diverse eating, regular exercise appears in more and more students everyday life. Furthermore we can say, that students are aware of healthcare, the importance of exercises, and the engagement toward physical exercises. It appears from the above and the results of our measurements, how important a good healthcare program would be in primary school already, supported with a good healthcare program, which can be transferred to secondary and vocational schools later on, since the survey shows how the willingness toward sporting decreases among the students are older ages. The measurement is a given value, the institutions can incorporate this either into their educational program or healthcare strategy.

Important to note: Children need to be examined by relative body fat index regularly. Ensuring additional physical activity and adequate sporting possibilities for children with overweight and obesity issues, furthermore it is highly important to start education and teaching about healthy lifestyle; the educational effect of the secondary social environments, acquire health-related knowledge on a skill-level.

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