Lifestyle and health behavior of school aged children in Krasnoyarsk (Russia), Lithuania and Grodno (Belarus)

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ABSTRACT

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Purpose: The aim of the study was to analyze the complex interaction of lifestyle-elements of school-aged children in Krasnoyarsk (Russia), Lithuania and Grodno (Belarus) for inactivity overweight and malnutrition that is ranked among the most frequent risk factors concerning the healthy development of children.

Material and methods: Participants from all countries (n=3038) have completed a questionnaire in a classroom setting. The instruments used to assess different lifestyle areas: nutritional behaviour, media consumption and sports club membership.

Results: The research is based on the hypothesis that the development of adolescents` lifestyles is a complex process in which physical activity, eating habits and media consumption play the major role. Krasnoyarsk has the lowest percentage of over-weight and obesity, in Belarus the percentage of underweight children increases with higher status. With regard to media consumption, our data allow to differentiate television consumption (about four hours and more per day) on the one hand and computer consumption. Belarus has the lowest position in this point. The degree of organization in sports clubs differ significantly among the countries. In Russia and Lithuania, the percentage is more below-average, but the percentage of children with a very high workload (three or more days per week) is extra high.

Conclusions: Significant differences concerning health behavior of children as well between the countries as within the countries were found. In all dimensions, gender-specific differences are most distinct in Belarus.

Key words: lifestyle-elements, school-aged children.

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INTRODUCTION

In order to analyze lifestyles, existing research looks at the attitudes as well as at the behavior of people [1]. The aim of the study was to analyze the complex interaction of lifestyle-elements of school-aged children in Krasnoyarsk (Russia), Lithuania and Grodno (Belarus) for inactivity overweight and malnutrition that is ranked among the most frequent risk factors concerning the healthy development of children. In the context of health-related research on young people's lifestyles such as components as physical activity, nutrition and media consumption are of crucial importance [2]. Up to now the interaction of these lifestyle spheres has not yet been explored in detail. The analysis of these behavioral patterns in a cross-cultural comparative perspective will help to improve the knowledge of similarities and differences in children's lifestyles.

The research is based on the hypothesis that the development of adolescents` lifestyles is a complex process in which physical activity, eating habits and media consumption play the major role. How these areas are integrated in the lifestyles leads to a strong differentiation of lifestyles between active and healthy lifestyles, on the one hand, and passive and unhealthy lifestyles, on the other hand. Since inactive lifestyles have become a problem in most modern societies the research project is of international interest. Consequently, the data collection has taken place in Belarus, Russia, Lithuania. With regard to the development of children's lifestyles, the international comparison will allow two things: firstly, to find similarities in lifestyles across the different cultures, and secondly to assess differences due to country-specific conditions.

This contribution will give the first overview of the different country samples. The instruments used to assess different lifestyle areas and provide the first descriptive data on the percentage of overweight and obese children as well as on nutritional behavior, media consumption and sports club membership of the youngsters in the different countries.

MATERIAL AND METHODS

A total of 3038 pupils participated in the study. Lithuania (n=1038), Russia (n=1000) and Belarus (n=1000) have taken part in the research. All samples consist of a randomly chosen population of children in 4th grades from schools. In all cases, the headmasters of schools have supplied the approve of the parents to research of the children. Teachers, psychologists, and social pedagogues of the selected schools were introduced to the procedure and helped to carry out the survey.

Participants from all countries have completed a questionnaire in a classroom setting. The advantage of the classroom-setting is that there are hardly any missing values and consequently - due to a stratified random selection of schools - no systematic bias in the sample [3].

This procedure also assures a stratified sample with regard to the socio-economic status of the children. In order to analyze the different health-related behavior validated instruments were used.

The questionnaire was translated into the Russian and Lithuanian language and later, translated back into English by an independent translator and submitted to the authors for checking. After the consent of the authors of the questionnaire was received, a test research was carried out that was intended for the clarification of whether the respondents understood the questions, what the uncertainties were, and how long it would take to complete the questionnaire. This process led to culture-specific adaptations of some items, especially with regard to nutritional behavior.

With regard to nutritional behavior the Food-Frequency-Method has been used. This method belongs to the retrospective measuring methods. The questionnaire consists of a food list of 21 different foods [4]. By the Nutrition Pattern Index, a raw classification is possible. The retrieval of food frequency of different food conduces the evaluation of eating habits concerning an ideal nutrition [5]. The KOPS-Study [6] suggests a comparison of the food frequency with the recommendations of the research institute for children's nutrition. The „Nutrition Pattern Index" serves as a means to assess (in terms of an optimized mixed nutrition) good or bad nutritional habit. It is an accumulative index, which allows to compare individual nutrition habits with the recommendations of the „German Society for Nutrition" (DGE).

Additionally, the children have been measured and weighed. The obtained values for size and weight were used to calculate Body Mass Index. For international comparisons, Cole et al. [7] recommend a method which refers to international cut-off points for body mass index for overweight and obesity by sex between 2 and 18 years, defined to pass through the body mass index of 25 and 30 kg/ml at age 18 obtained by averaging data from Brazil, Great Britain, Hong Kong, Netherlands, Singapore, and United States.

To analyze media consumption Todd/ Currie recommends using the following categories: high level television consumption, computer consumption and Play Station consumption ($\geq$ four hours per day [8]. The sports club membership has been classified as follows: "low workload" for one-day sports club activity per week, two days of

sports club activity weekly were classified as "middle workload" and the children with an activity of three or more days per week were classified as the group with "high workload."

Data analysis of statistical research was carried out by using SPSS 16.0 for Windows. The respondents were identified by allocating a sequence number to each of them. The number was written down on the questionnaire for future reference. Statistical significance of between-group differences in mean values was assessed by t-test, and in categorical variables was examined by χ^2 criterion. Differences were considered statistically significant when p< 0.05.

RESULTS

Comparing the data from all countries with regard to the prevalence of overweight and obesity, nutritional behavior, media consumption and sports club membership following results can be pointed out:

Overweight and obesity

Russia has the lowest percentage of overweight (11.3%) and obesity (2.6%) in comparison with the other countries of this sample. In Belarus, the percentage of overweight (16.1%) and obesity (4.6%), in Lithuania percentage of overweight (13.9%) and obesity (4.0%) was noted (Tab. 1). Significant differences between boys and girls in all countries were found. With regard to social status in Belarus, the percentage of underweight children increased with a higher status.

Nutritional behaviour

Children have been asked about their food consumption. The food list [4] is reduced to 21 different foods in this questionnaire. Table 2 shows the selection of conventional food and their consumption by the countries. The Food Frequency the Nutrition Pattern Index has been calculated. For the calculation, 12 foods were selected. They were chosen with regard to comparability among the countries. The „Nutrition Pattern Index" serves as a means to assess (in terms of an optimized mixed nutrition) good or bad nutritional habit and can take values from 0-14. It is an accumulative index, which allows to compare individual nutrition habits with the recommend-dations of the German Society for Nutrition" (DGE). Belarus and Russia had the lowest position with an index of 20.8±5.01 and 20.7±5.17 (in Lithuania - 21.5±5.06) (p<0.05). In all countries, girls had higher values than boys. Children with low socioeconomic status had below-average values concerning the nutrition-pattern-index. No correlation between socioeconomic status and nutrition pattern index was found.

Media consumption

Weekday and weekend have been introduced to differentiate the use of TV/PC/PS 4 hours or more per day (Fig.1). With regard to media consumption our data allows to differentiate between TV consumption (about four hours and more per day) and computer consumption. Belarus has the lowest position in this point (Fig.2). The percentage of TV consumption was higher for boys than girls. With regard to computer using differences between girls and boys were greater than TV consumption. Except for Russia, significant differences between gender and computer consumption were noted. Compared to girls, boys spend more than twice as much time using the computer. The lower the social status was related to the higher watching TV. No correlation between the social status and computer and Play Station using was found.

Sports club membership

The degree of sports club membership differed significantly between the countries. In Belarus, there were only 40.1% (Tab. 3). In Russia and Lithuania, the percentage was more below-average. Compared to girls, boys participated in the sports club more often than girls. Only 28.2% of the girls but 52.0% of the boys participated in the sports club. Children with a lower social status participated in the sports club less frequently than those with a high social status. The most popular boys' kind of sports were swimming and single combats (karate, judo), on the third place - game kinds (football, basketball, volleyball). Girls preferred gymnastics, sports dances, swimming, and tennis. A high percentage of children from Krasnoyarsk was engaged in winter kinds of sports. Only 34.5% of the respondents spend time on fresh air daily and 37.3% several times per week. Overall, 48.7% of mothers and 42.2% of fathers from Grodno, and 35.4 % and 29.2 % from Krasnoyarsk were not engaged in the physical activity and sport. In contrast in Lithuania, only 19.5% of mothers and 18.4% fathers did not participate in sport activity. About, 30% the families were not engaged in any kind of sport.

DISCUSSION

The results provide information about youths nutritional behavior, media consumption, and participation in the sport clubs in Lithuania, Russia and Belarus. In the present study, we have found significant differences concerning health behavior of children as well between the countries as within the countries were found. In all dimensions, gender-specific differences are most distinct in Belarus. The changing tendency towards the way of life shall be considered as the barometer of the social and economic development

of society and as criteria of sanitary-hygienic
welfare of all segments of population.

Table 1. BMI-value for calculated by Kromeyer – Hauschild and by Cole (%)

Groups of children	Groups of gender								
	Boys			Girls			All together		
	Grodno	Krasno-yarsk	Lithuania	Grodno	Krasno-yarsk	Kaunas	Grodno	Krasno-yarsk	Kaunas
Groups of BMI categorization according to Kromeyer-Hauschild									
Extreme underweight	0.6	5.3	2.5*	2.6	8.5	3.3*	1.6	6.8	2.9*
Underweight	3.4	7.0	3.5*	7.0	7.0	7.3*	5.2	7.0	5.4*
Normal weight	78.6	76.3	80.3*	75.0	75.5	77.2*	76.8	75.9	78.7*
Overweight	9.8	7.9	9.7*	10.4	6.2	7.5*	10.1	7.1	8.6*
Obesity	6.4	3.4	3.3*	4.4	2.3	3.9*	5.4	2.9	3.6*
Extreme obesity	1.2	0,2	0.8*	0.6	0.4	0,8*	0.9	0.3	0.8*
Groups of BMI categorization according to Cole									
Normal weight	77.6	85.9	82.2*	81.0	86.4	82.0	79.3	86.1	82.1*
Overweight	16.6	11.3	13.9*	15.6	11.3	13.9	16.1	11.3	13.9*
Obesity	5.8	2.8	3.9*	3.4	2.3	4.1	4.6	2.6	4.0*

* statistical significance level of chi^2 test of differences between groups (groups of BMI categorization according to Cole) (p<0.05)

Table 2. Daily food consumption by country (%)

	Fruits	Vegetables	Sweets	Crisps	Soft drinks	Nutrition Pattern Index
Belarus (Grodno)	48.5*	37.4*	34.4*	20.9*	34.4*	20.8±5.01
Russia (Krasnoyarsk)	56.1*	39.9*	27.3*	28.2*	33.9*	20.7±5.17
Lithuania	46.7*	33.3*	28.0*	37.0*	41.3*	21.5±5.06**

* statistical significance level of chi^2 test of differences between groups (p<0.05)
** statistical significance level of chi^2 test of differences between Lithuania and 2 towns (p<0.05)

Table 3. Membership in sports club %

Membership in sports club	Groups of gender								
	Boys			Girls			All together		
	Grodno	Krasno-yarsk	Lithuania	Grodno	Krasno-yarsk	Lithuania	Grodno	Krasno-yarsk	Lithuania
No	48.0	33.0	35.0*	71.8	48.8	56.4	59.9	40.4	46.7*
Yes	52.0	67.0	65.0*	28.2	51.2	43.6	40.1	59.6	54.3*

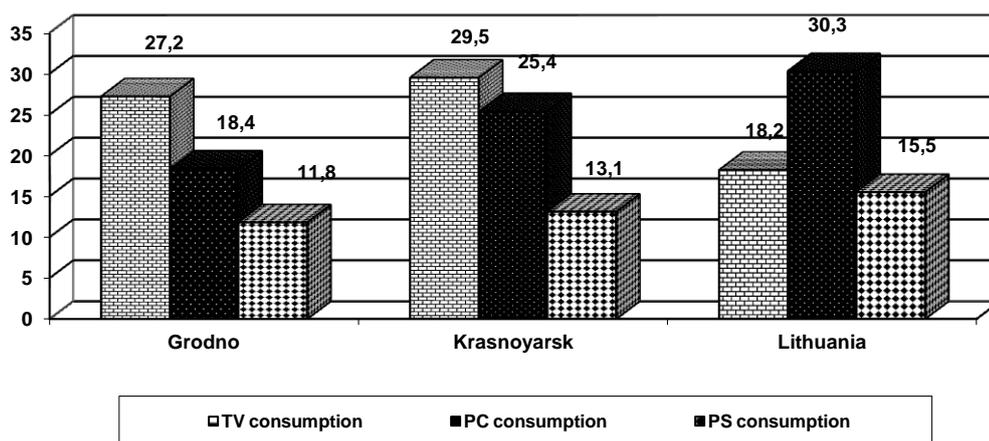*statistical significance level of chi^2 test of differences between groups (p<0.05)

Figure 1. Children who report high level consumption (TV, PC and PS) 4 hours or more per day (%)
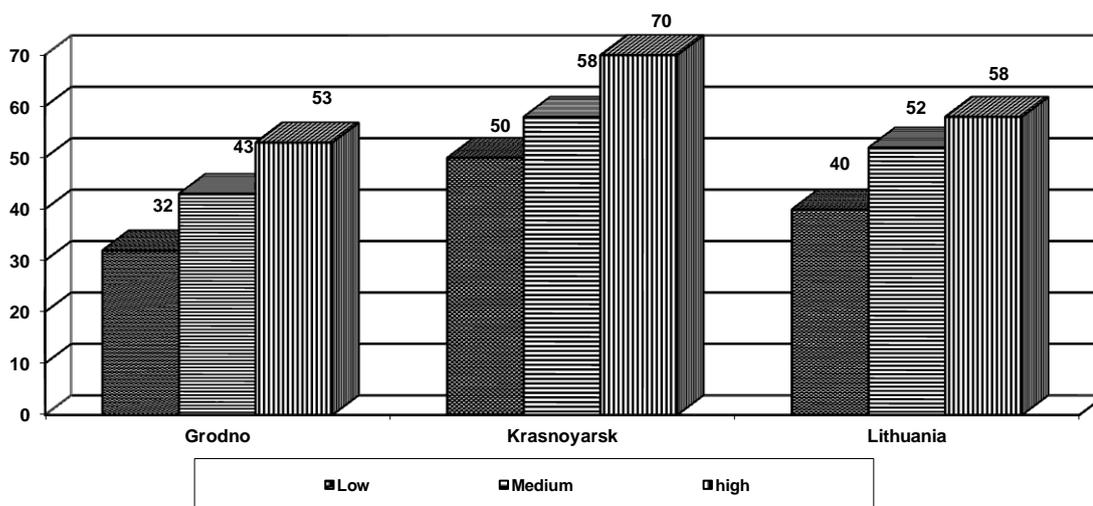

Figure 2. Children who report watching television 4 hours or more per day (%)

Inactivity, overweight and malnutrition rank among the most frequent risk factors concerning the healthy development of children [7-10]. It is hard to change the behavioral stereotypes of adults, but it is possible to influence the behavior of the new generation. The period of time when a child realizes herself as a person is at 9-10 years old. It is a new level of social and biological development starts, it is established as "I and society." The habits acquired in childhood are very important. They remain for the rest of the life and become either a basis for an active and healthy way of life or lead to dependence and destructive behavior. It is difficult to name the motive which determines will and unwillingness of the children for healthy lifestyle. We can assert that, there are a lot of valuable researches of people's way of life were done. Despite that we should mention a

variety of the scientific opinions accompanied by controversy as well as the absence of monitoring of actions. Therefore, the results only become acceptable for publicity but are not analyzed and are not used.

In comparison to American children, Russian children completed fitness test significantly better [11]. The authors found that Russian students walk to and from school; the students in both settings who achieved a superior fitness level participated in after school physical activity; after-school activities for the American students appeared to be more recreational orientated than the Russian students, who participated in structured training in sports clubs.

Volbekiene and Griciūte [12] analyzed the differences in health-related fitness among 12-, 14-, and 16-year-old Lithuanian boys and girls from

1992 to 2002. They found a marked decrease in aerobic fitness and flexibility and a slight increase in abdominal muscle endurance among Lithuanian schoolchildren. Leg muscular power decreased slightly in girls but remained unchanged in boys. A decrease in daily physical activity was the most likely contributing factor to the decrease in aerobic fitness and flexibility.

The obesity epidemic is spreading to low-income and middle-income countries as a result of new dietary habits and sedentary ways of life, fueling chronic diseases and premature mortality. Cecchini et al. [13] presented an assessment of public health strategies designed to tackle behavioral risk factors for chronic diseases that are closely linked with obesity, including aspects of diet and physical inactivity, in Brazil, China, India, Mexico, Russia, and South Africa. The authors described different strategies, including health information and communication about the benefits of healthy eating and physical activity; fiscal measures that increase the price of unhealthy food content or reduce the cost of healthy foods rich in fibre; and regulatory measures that improve nutritional information or restrict the marketing of unhealthy foods to children.

Our findings are in agreement with previous studies investigating the incidence of the obesity in children [14-17]. In a HBSC-study, healthy nourishments like fruits and vegetables were more often consumed by girls and Fast Food by boys [4]. In the present study, children with the lowest social status had below-average values concerning the nutrition-pattern-index. The importance of regular exercises and the lack of mandatory physical education programmers in primary school children's daily routine have been suggested as possible contributing factors for obesity [8,15].

Hamar et al. [18] reported that Hungarian youth spent only 36 minutes per day engaged in active transport or sport and exercise during weekdays and weekend days. Boys were more active than girls. This is in accordance with our findings.

CONLUSIONS

Significant differences concerning health behavior of children as well between the countries as within the countries were found. In all dimensions, gender-specific differences are most distinct in Belarus.

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