

ORIGINAL RESEARCH PAPER

NON-FORMAL PHYSICAL EDUCATION IN SCHOOL AS FACTOR FOR INNATE PHYSICAL POWERS TRAINING**Asta Šarkauskienė**

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Abstract

The aim of the study was to investigate the influence of two-year non-formal physical education content on innate physical powers development of 11-13 years old children. The study continued for two years in four Klaipėda city comprehensive schools that were selected under the criterion method. Children from two schools were assigned to the experimental group E (n=119); children from the other two schools were assigned to the control group C (n=120). Considering young adolescents' participation in non-formal physical education (NFPE) activities, children from experimental and control groups were appointed to one of three groups: E₁ and C₁, E₂ and C₂, E₃ and C₃. At the beginning (2007-10, 11), in the middle (2008-05), and at the end (2009-05) of the pedagogical experiment, physical development measures and physical capacity tests were taken and health indices were analyzed under the method of data analysis. During experimental period, children of E₁ group were ill the least. During the second year, their morbidity rate was statistically significantly ($p=0,034$) lower than C₁ group's. Educational content did not affect the changes in height indices ($p>0.5$) but it positively influenced changes in normalization of body mass index of E₁ group girls and boys. Physical fitness results of experimental groups (E₁, E₂, E₃) children in many cases were statistically significantly ($p<0.05$) higher than children' from control groups (C₁, C₂, C₃). Education content as being implemented, while uniting and integrally developing knowledge, abilities, and attitudes as well as applying child activating education methods and forms, positively influences children physical health, physical development, and physical capacity.

Key words: *non-formal physical education, 11-13 years old children, innate physical powers.*

Introduction

The period of early adolescence (age 11-13) is a very complex and significant human's development phase on psychological as well as on biological aspect. A very intense biological maturation process and physical characteristics development proceed in this life phase. Normal young adolescents' growth and development need physical activeness on a daily basis. World Health Organization and European Commission approved documents (COM(2005) 637; EUR/05/5048378; EUR/06/5062700/8; WHA63.14 (2010) et al.) that emphasize the importance of physical health, physical activity, and other innate powers training.

Empirical researches estimated that physical activity of 11-13 year children is insufficient (Janssen, 2007; Velert et al., 2008; Bucks, Finne, Kolip, 2008; Beaulac, Bouchard, Kristjansson, 2009; Schneider, Dunn, Cooper, 2009), organism's functional (Tutkuvienė, 2005; Комков et al. 2008) and physical capacity (Мирошниченко, Астраханцев, 2005; Сиявский, Власов, Сергеев, 2009) have a tendency to decline as well as state of their health (Gaidelytė, Cičėnienė, 2008; Barnekow et al. 2009; Габдрахманова, Коган, 2009).

Lithuanian scientists emphasize the significance of innate physical powers development but major attention goes on the formal training of these powers. In recent years there has been a growing appreciation of the importance of learning in non-formal settings (European Commission, 2012). In Lithuania non-formal physical education (NFPE) is carried out inside and outside school. NFPE in school is described as non-structural, organized, and purposeful after-school physical education (Šarkauskienė, 2011). It is still understood narrowly and from one-sided view, i.e. is oriented towards teaching and development of the motion and training of physical qualities. Curriculum content is focused on upcoming sport events.

Lithuanian scientists suggest reforming the content and organization of NFPE in school. V. Blauzdys, D. Šinkūnienė (2005) offer implementation of various sport competitions and, in such way, to involve the whole school community. L. Trinkūnienė et al. (2009) conclude, under the following empiric research results, that such activity is especially useful for pupils with lower level of physical fitness and recommend finding ways to involve those children into the process of NFPE in school.

Foreign scientists also discuss this issue. A. L. Carel et al. (2011) recommend for NFPE to concentrate most attention on lifestyle-focused

activities such as walking, games, station-based activities, and snowshoeing. B. Wnek (2006) proposes education content that includes physical fitness activities, skills, games, and rhythm and dance activities, each based on a specific holiday or seasonal theme.

In present study the following research question was formulated: *What content of NFPE in school can positively influence innate physical powers development of 11-13 years old children?*

The aim of the study was to investigate the influence of two year non-formal physical education content on innate physical powers development of 11-13 years old children.

Material and methods

Subject. The target sample consisted of groups from grades 5-6 (n = 239). The study included 123 (51.5 %) girls and 116 (48.5 %) boys. Girls' and boys' results were analyzed separately.

Organization of the study. The study continued for two years in four Klaipėda city secondary schools, which were selected using the criterion method. Students from two schools were assigned to the experimental group E (n = 119) (Fig. 1); students from the other two schools were assigned to the control group C (n = 120).

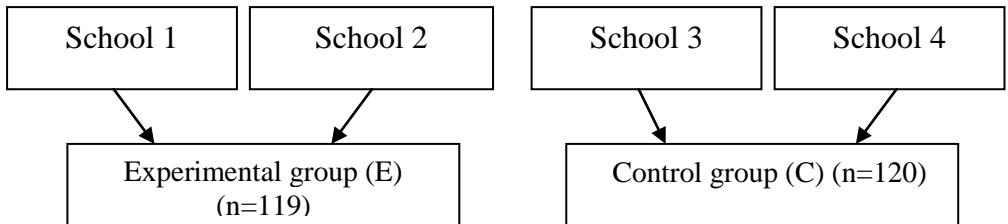


Figure 1. Distribution of schools

Taking into account students' participation in NFPE in school, location, and frequency, testees from the experimental and the control groups were assigned to E₁ and C₁, E₂ and C₂, E₃ and C₃ groups accordingly:

1. Children, who regularly participate in NFPE in their secondary school (E₁, C₁).
2. Children, who participate in NFPE outside school and are only indirectly involved in NFPE in school to participate in organized sport and fitness activities (E₂, C₂).
3. Children, who are only indirectly involved in NFPE in school to participate in organized sport and fitness activities (E₃, C₃).

The experimental group (E) had been working under the program developed by the author of this article. The content of the program included various sport and agility games, relay races, athletics, and gymnastics. The following principles were followed: willingness to volunteer, accessibility, relevance, and individualization; different activating methods (discussion, case study, “Brain hedgehog“, arguments “For and against“, “Brainstorm“, learning in groups, etc.) were applied as well. Education content was implemented during sport activities and in various sport and wellness events (sport and wellness festivals, competitions, quizzes, trips). 80 % of trainings content consisted of sport activities and 20 % - of various sport and fitness events.

The control group (C) worked under NFPE programs prepared by teachers and approved by school directors, who followed the regulations of Lithuanian Olympic festival.

Priorities of the experimental group:

1. Integral growth of physical development, physical activity, physical fitness, and health.
2. Integration of children with lower level of health and physical fitness.
3. Content that corresponds to the needs and preferences of children.
4. Methods and forms that activate and train individual development process.

Priorities of the control group:

1. Teaching and development of motions performance.
2. Physical qualities training.
3. Training of the most physically capable pupils.
4. Curriculum content focused on upcoming sport events.

Both experimental and control groups shared the duration (1 hour) and frequency (twice a week) but were different in their education content.

Methods: pedagogical experiment, document analysis, measuring physical development level, testing, and statistical analysis. Pedagogical experiment continued for two years in two Klaipėda city secondary schools. Non-formal education activities were held at the end of formal education twice a week. Activity duration was 1 hour. *Document analysis:* after applying this method, the average of pupils' age was determined. The age average was 11.3 years during the research I, 11.9 years – during the research II, and 12.9 years – during the research III. Children' health indices were analyzed: assigning to medical groups of physical capacity, morbidity and morbidity in one academic year (academic year 2007–2008, 2008–2009)

Measuring physical development level: anthropometric (height, weight) and physiometric (vital capacity; right and left hands power) measuring were performed and comparative values – BMI that reveals weight and height proportion - was established. *Testing:* five physical fitness tests were conducted: sit and reach (lower back flexibility), sit-ups (abdominal strength and muscular endurance), flexed-arm hang (upper body strength and endurance), standing long jump (explosive leg power) and 1 mile walk/run (cardiorespiratory endurance). *Statistical analysis:* the arithmetic mean (\bar{x}), the mean difference (MD), the standard deviation (SD), and the effect size r were calculated. Student's t test, Wilcoxon test, and Mann–Whitney U test were applied. Statistical analysis was performed using SPSS software (version 17.0).

Results

Alternation and evaluation of 11-13 years old children health indices.

Data analysis of 11-13 years old children' morbidity during one academic year revealed that, during the first and the second academic year of pedagogical experiment, pupils from the experimental group, who regularly participated in NFPE in school (E_1), were ill occasionally (Fig. 2).

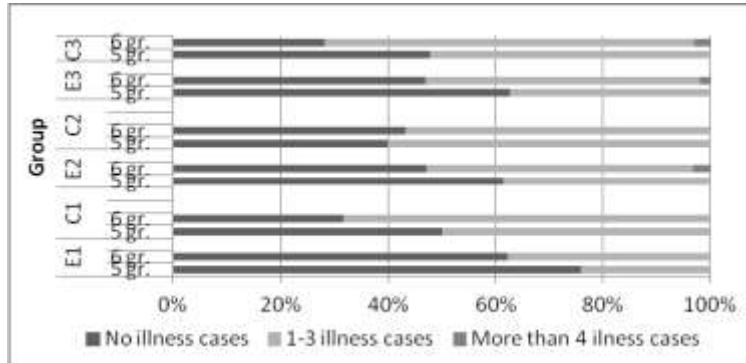


Figure 2. Percentage distribution of morbidity rates during one academic year in experimental and control groups

It was established that, during the second research year (academic year 2008–2009), pupils' from E_1 group morbidity rate was statistically significantly lower than children' from C_1 group, $U=222.50$, $z=-2.12$, $p=0.034$; $r=-0.30$. During the same year, the indices of morbidity during one academic year also statistically significantly differed in pupils, who participated in NFPE in school only partly – in sport and wellness events (E_3

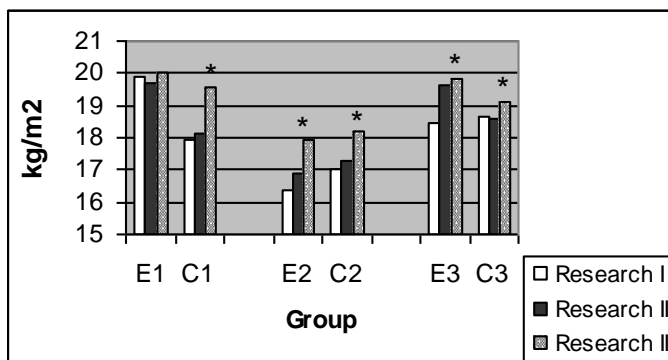
and C₃): pupils from experimental group were ill more rarely, $U=222.50$, $z=-2.06$, $p=0.040$; $r=-0.19$. Cases of respiratory system were identified in children from all groups mostly.

After one-year of the pedagogical experiment and after comparing results of groups' E₁ and E₂ assigning to medical physical capacity groups, it was established that more testees from group E₁ were assigned to the main physical capacity group but these indices did not differ statistically significantly, $U=265$; $z=-1.56$; $p=0.120$; $r=-0.22$. Group's E₂ indices of assigning to special medical physical capacity group did not differ statistically significantly from testees of group C₂, $U=543.00$; $z=-0.80$; $p=0.423$; $r=-0.10$. Significant differences were not found between groups E₃ and C₃ either, $U=1595.00$; $z=-0.931$; $p=0.352$; $r=-0.09$.

When analysing cases of children of age 11-13 it was estimated that diseases of eye and adnexa and symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified - were the most common cases in all testees' groups.

Alternation and evaluation of 11-13 years old children physical development indices. Morphologic (height and weight) indices of all groups both sexes respondents increased statistically significantly ($p<0.05$).

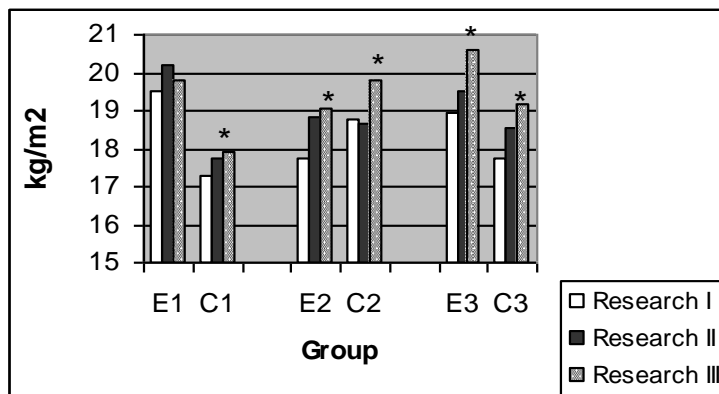
At the beginning of the pedagogical experiment, the highest BMI rates were estimated in E₁ girls' group ($19.90 \pm 2.65 \text{ kg/m}^2$) - they on average were higher in 2.92 kg/m^2 than average meanings of Lithuanian girls of this age. However, during two academic years, BMI of this group young adolescents varied fractionally and, at the end of pedagogical experiment, this difference decreased to 1.31 kg/m^2 , i.e. height and weight ratio of girls, who participated in NFPE in school, became more proportional (Fig. 3).



Note. * $p<0.05$

Figure 3. Alternation of body mass index (BMI) in experimental and control group girls

During two-year experimental period, boys' BMI indices improved significantly ($p < 0.05$) in all groups except in experimental group, which constantly participated in NFPE in school (E_1) (Fig. 4). BMI of all groups were higher than average meaning of 13 years old Lithuanian boys (18.07 kg/m^2 ; Tutkuvienė, Jakimavičienė, 2004).



Note. * $p < 0.05$

Figure 4. Alternation of body mass index (BMI) in experimental and control group boys

Right and left hands power in all groups varied similarly ($p > 0.05$). Vital capacity (future – VC) indices improved in 11-13 years children of all groups. However, these changes were not equal in all groups and this revealed the influence of means, applied during experimental period, on alternation of VC indices. During two academic years, statistically significant ($p < 0.001$) changes were estimated in all experimental (E_1 , E_2 , E_3) girls groups and in one control (C_3) girls' group.

Boys' VC indices statistically significantly ($p < 0.05$) improved in all groups, however, in experimental groups, which constantly participated in NFPE in school (E_1) and in school organized sport and wellness events (E_3), these changes were higher than in control groups (C_1 and C_3): during two years of the pedagogical experiment, VC indices in E_1 group boys grew on average in $394,45 \text{ cm}^3$ and in C_1 - $204,54 \text{ cm}^3$. In E_3 group, during the experimental period, VC indices improved in $238,9 \text{ cm}^3$, C_3 - $136,5 \text{ cm}^3$.

Alternation and evaluation of 11-13 years old children physical capacity indices. When analyzing physical capacity indices during the research III, it was estimated that E_1 group girls' indices of flexibility, abdominal strength and muscular endurance, cardiorespiratory endurance and boys' indices of flexibility, abdominal strength and muscular endurance, upper body strength and endurance, and cardiorespiratory endurance indices

were statistically significantly ($p < 0.05$) higher than young adolescents' from C_1 group (Table 1). E_2 group girls' and boys' indices of abdominal strength and muscular endurance, upper body strength and endurance, and cardiorespiratory endurance were statistically significantly ($p < 0.05$) higher than young adolescents' from C_2 group. E_3 group girls' indices of flexibility, explosive leg power, abdominal strength and muscular endurance, and cardiorespiratory endurance and boys' indices of cardiorespiratory endurance were statistically significantly ($p < 0.05$) higher than young adolescents' from C_3 group.

Table 1
Differences of physical capacity indices in experimental and control groups young adolescents' (research III)

Groups	Statistical indicators	Sit and reach (cm)	Standing long jump (cm)	Sit-ups (N/30 sec)	Flexed-arm hang (ms)	1 mile walk/run (sec)
<i>GIRLS</i>						
$E_1:C_1$	t	4,200	0,487	3,709	-0,422	-2,150
	p	0,000***	0,631	0,002**	0,677	0,044*
$E_2:C_2$	t	0,339	1,772	2,216	2,368	-4,376
	p	0,739	0,090	0,042*	0,026*	0,000***
$E_3:C_3$	t	2,089	3,547	3,719	1,859	-8,840
	p	0,040*	0,001***	0,000***	0,067	0,000***
<i>BOYS</i>						
$E_1:C_1$	t	3,177	1,714	2,379	2,848	-2,770
	p	0,005**	0,103	0,029*	0,010**	0,015*
$E_2:C_2$	t	0,069	1,335	3,414	2,504	-4,286
	p	0,945	0,190	0,002**	0,017*	0,000***
$E_3:C_3$	t	0,517	1,228	1,979	1,560	-4,564
	p	0,608	0,226	0,058	0,133	0,000***

Note. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Discussion

Under the data of Klaipėda City Public Health Bureau (2009), 77.9% of 5-8 graders were assigned to the main, 19.3 % - to preparatory, and 2.7 % – to special medical physical capacity group in Klaipėda city in 2008. Pupils in our research were assigned to the main physical capacity group in higher number than average statistics in Klaipėda city.

The main cases of young adolescents, who participated in the research, were eye diseases and adnexa and symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified. Scientists and health professionals indicate sight disorders to be as one of the most

common diseases of adolescents. R. Gaidelytė, V. Cicėnienė (2009) state that sight disorders were identified in 15.6 % of children (age 0-17). In 2008 sight disorders were identified in one third of 5-8 graders. Additionally, professionals tend to address that cases of diseases of eye and adnexa rapidly grow: the number of sight disorders grew in 3.4% in the period 2001–2005 (Gaižauskienė et al., 2006) and in the period 2005 – 2007 it increased more in 1.9%; and among children of age 0-17 it amounted 15.2% of all cases (Gaidelytė, Cicėnienė, 2008).

Empiric data substantiate the influence of physical exercises that were performed during non-formal physical education in school process on children's organism resistance to diseases (morbidity during one academic year). When analyzing 11-13 years old children's assigning to medical physical capacity groups and results of morbidity and their alternation, influence of experimental program did not emerge. We use to think for these changes to be attained, NFPE only is not enough; children's wellness (healthy nutrition, physical activity, prophylaxis of chronic non-infectious diseases) promotion is necessary in formal and non-formal education as well as in family environment.

J. Tutkuvienė (1995) indicates that height is the most innate and the least changing of all morphological and functional condition indices. Our research results have revealed that experimental program did not influence alternation of pupils' height indices – statistically significant changes between groups were not identified. A. D. Baxter-Jones et al. (2008), M. C. Erlandson et al. (2008) also estimated that format and extent of physical activity do not determine growing speed.

Other development index – weight – was much more labile than height and varied more because of biological (nutrition, diseases), social, economical, and cultural factors and even because of beauty criteria (Tutkuvienė, Jakimavičienė, 2004). Scientists (Lowry et al., 2007; Julia et al., 2008; Cora et al., 2009) indicate that every year more and more adolescents' weight does not correspond recommendation norms. World Health Organization (2010) admits that children' overweight and obesity indices have reached epidemic level in many industrial countries. Supposedly, the number of children with overweight and obesity in EU grows in more than 400 000 cases per year (European Parliament, 2007/2086 (INI)). Alternation of BMI index during pedagogical experiment grounds positive influence of applied program on the BMI indices alternation of experimental group girls and boys (E_1), who participated in NFPE in school: their height and weight ratio became more proportional. Physical development in early adolescence was evaluated depending on

functional parameters as well, i.e. on vital capacity and hands power. When child grows, his/her VC also grows (Malina, Bouchard, Bar-Or, 2004; Armonaitė-Engelmanienė, 2008). This was proved by our research data: hands power and VC increased in all groups during the research period. Right and left hands power in all groups varied similarly, except changes of VC indices were more considerable in the experimental than in the control groups.

Theoretical and empirical research results reveal early adolescence period as particularly favorable for increase of physical capacity (Курамшин 2007; Сальников, 2008; Фролов, 2009). Statistically significant ($p < 0.05$) differences in the experimental and the control groups' physical capacity indices at the research III revealed positive influence of created education content and children activating strategies on physical capacity of young adolescents, who participated in non-formal physical education in school for two years (group E₁), as well as of schoolchildren, who only partly experienced influence of non-formal physical education in school (groups E₂ and E₃).

Conclusions

11-13 years old children innate physical powers training, when non-formal education content is being implemented, while uniting and integrally developing knowledge, abilities, attitudes and applying child activating training methods and forms, positively influences their physical health, physical development, and physical capacity.

References

1. Armonaitė-Engelmanienė, R. (2008). Brendimas, priežiūros ypatybės. *Paauglių sveikatos priežiūra šeimos gydytojo praktikoje* [Maturation, care peculiarities. *Adolescents' health care in the practice of family doctor*]. Kaunas: Vitae Litera.
2. Barnekow, V., Currie, C., Letsch, C. et al. (ed.) (2009). A Snapshot of the Health of Young People in Europe. *A report prepared for the European Commission Conference on Youth Health*. Brussels, Belgium. Retrieved on 28 February 2010 from <http://www.euro.who.int/Document/E93036.pdf>.
3. Baxter-Jones, A. D., Eisenmann, J. C., Mirwald, R. L. et al. (2008). The Influence of Physical Activity on Lean Mass Accrual During Adolescence: A Longitudinal Analysis. *Journal of Applied Physiology*, 105(2), 734–41.

4. Beaulac, J., Bouchard, D., Kristjansson, E. (2009). Physical Activity for Adolescents Living in a Disadvantaged Neighbourhood: Views of Parents and Adolescents on Needs, Barriers, Facilitators, and Programming. *Leisure/Loisir: Journal of the Canadian Association for Leisure Studies*, 33(1), 537–561.
5. Blauzdys, V., Šinkūnienė, D. (2005). *Mokinių papildomo fizinio ugdymo plėtra mokykloje. [Schoolchildren complementary physical education development in school]*. Vilnius: VPU.
6. Bucksc, J., Finne, E., Kolip, P. (2008). The Trans theoretical Model in the Context of Physical Activity in a School-based Sample of German Adolescents. *European Journal of Sport Science*, 8(6), 403-412.
7. Carrel, A. L. et al. (2011). An After-school Exercise Program Improves Fitness, and Body Composition in Elementary School Children. *Journal of Physical Education and Sports Management*, 2(3), 32-36.
8. COM (2005) 637. *Green paper “Promoting healthy diets and physical activity: a European dimension for the prevention of overweight, obesity and chronic diseases”*. Retrieved on 18 May 2008 from http://ec.europa.eu/health/ph_determinants/life_style/nutrition/documents/nutrition_gp_en.pdf.
9. Cora, E. Lewis, M. D., MSPH et al. (2009). Mortality, Health Outcomes, and Body Mass Index in the Overweight Range. *Circulation*, 119, 3263–3271.
10. Erlandson, M. C., Sherar, L. B., Mirwald, R. L. et al. (2008). Growth and Maturation of Adolescent Female Gymnasts, Swimmers, and Tennis Players. *Medicine and science in sports and exercise*, 40(1), 34–42.
11. EUR/05/5048378: *European strategy for child and adolescent health and development*. Retrieved on 10 October 2008 from http://www.euro.who.int/__data/assets/pdf_file/0020/79400/E87710.pdf
12. EUR/06/5062700/8. *European Charter on counteracting obesity*. Retrieved on 14 July 2010 from http://www.euro.who.int/__data/assets/pdf_file/0009/87462/E89567.pdf.
13. European Commission (2012). *Validation of non-formal and informal learning*. Retrieved on 15 June 2012 from http://ec.europa.eu/education/lifelong-learning-policy/informal_en.htm.
14. Gaidelytė, R., Cicėnienė, V. (edit.) (2009). *Lietuvos gyventojų sveikata ir sveikatos priežiūros įstaigų veikla 2008 m. [Lithuanian citizens' health and health care institutions activity in 2008]*. Retrieved on 29 January 2010 from www.lsic.lt

15. Gaidelytė, R., Cicėnienė, V. (edit.) (2008). *Lietuvos gyventojų sveikata ir sveikatos priežiūros įstaigų veikla 2007 m.* [Lithuanian citizens' health and health care institutions activity in 2007]. Vilnius: Lietuvos sveikatos informacijos centras.
16. Gaižauskienė, A. et al. (edit.) (2006). *Lietuvos gyventojų bendrasis sergamumas 2001–2005 m. privalomojo sveikatos draudimo informacinės sistemos SVEIDRA duomenimis.* [Lithuanian citizens' common morbidity in 2001-2005 under the data information system SVEIDRA of compulsory health insurance]. Vilnius: Lietuvos sveikatos informacijos centras.
17. INI/2007/2086. *Role of sport in education.* Retrieved on 27 February 2010 from <http://www.europarl.europa.eu/oeil/file.jsp?id=5478932>.
18. Janssen, L. (2007). Physical Activity Guidelines for Children and Youth. *Applied Physiology, Nutrition & Metabolism*, 32, 109–121.
19. Julia, M. et al. (2008). Tracking for Underweight, Overweight and Obesity from Childhood to Adolescence: A 5-Year Follow-Up Study in Urban Indonesian Children. *Hormone Research*, 69, 301–306.
20. *Klaipėdos miesto visuomenės sveikatos biuras* [Klaipėda City Public Health Bureau], (2009). Retrieved on 24 November 2009 from www.sveikatosbiuras.lt.
21. Lowry, R., Lee, S. M., Galuska, D. A. et al. (2007). Physical Activity-Related Injury and Body Mass Index Among US High School Students. *Journal of Physical Activity and Health*, 2007, 4, 325–342.
22. Malina, R. M., Bouchard, C., Bar-Or, O. (2004). *Growth, maturation, and physical activity.* Champaign, Ill: Human Kinetics.
23. Schneider, M., Dunn, A., Cooper, D. (2009). Affect, Exercise, and Physical Activity Among Healthy Adolescents. *Journal of Sport & Exercise Psychology*, 2009, 31, 706–723.
24. Šarkauskiene, A. (2011). *Jaunujų pauglių prigimtinių fizinių galių neformalusis ugdymas mokykloje* [Non-Formal Education In School Of Young Adolescents' innate Physical Powers]. Doctoral Dissertacion. Klaipėda, KU.
25. Trinkūnienė, L. et al. (2009). Papildomo fizinio aktyvumo pratybų poveikis silpno fizinio pajėgumo mergaitėms [Influence of extra-curricular physical activity on girls with poor physical fitness]. *Ugdymas Kūno kultūra Sportas*, 4 (75), 86–91.
26. Tutkuvienė, J. (1995). *Vaikų augimo ir brendimo vertinimas.* [The assessment of children development and maturation]. Vilnius: Meralas.

27. Tutkuvienė, J. (2005). Lietuvos vaikų ir paauglių morfologinių ir funkcinių rodiklių sąsajos ir pokyčiai per pastaruosius dešimtmečius. *Fizinis aktyvumas ir sveikata: vaikų ir jaunimo fizinio aktyvumo problemos*. [Lithuanian children and adolescents correlations of morphological and functional indices and changes during the latter decades. *Physical activeness and health: children and youth physical activeness problems*]. [Electronic optical disc]: national symposium, 18-19 September, Birštonas.
28. Tutkuvienė, J., Jakimavičienė, E. M. (2004). Kūno sudėjimo rodikliai ir jų sąsajos su bendra sveikatos būkle [Indices of body frame and their connections with general health status]. *Medicinos teorija ir praktika*, 1(37), 59–63.
29. Velert, C. P., Devis, J. D., Carrillo, V. et al. (2008). Variability of Spanish Adolescents' Physical Activity Patterns by Seasonality, Day of the Week and Demographic Factors. *European Journal of Sport Science*, 8(3), 163–171.
30. WHA63.14 (2010). *Set of recommendations on the marketing of foods and non-alcoholic beverages to children*. Retrieved on 12 November 2010 from http://whqlibdoc.who.int/publications/2010/9789241500210_eng.pdf.
31. WHO (2010). *Reproductive health issues among adolescents and youth*. Retrieved on 18 March 2010 from www.searo.who.int/LinkFiles/Reproductive_Health_Profile_reproductive1.pdf.
32. Wnek, B. (2006). *Celebration Games: Physical Activities for Every Month*. Champaign, Human Kinetics Publishers.
33. Габдрахманова, Л. И., Коган, О. С. (2009). Научное обоснование системы оздоровления школьников младших классов методами адаптивной физической культуры. *Физическая культура: воспитание, образование, тренировка*, 2, 23–26.
34. Комков, А. Г., Филиппов, С. С., Малинин, А. В. et al. (2008). Развитие педагогических направлений физического воспитания школьников на основе социально – педагогического мониторинга. *Теория и практика физической культуры*, 3, 22–26.
35. Курамшин, Ю. Ф. (2007). *Теория и методика физической культуры*. Москва: Советский спорт.
36. Мирошниченко, Л. И., Астраханцев, Е. А. (2005). Инновационная программа физического воспитания школьников. *Физическая культура: воспитание, образование, тренировка*, 4, 60–64.

37. Сальников, В. А. (2008). Сенситивные и критические периоды как составляющие индивидуального развития. *Теория и практика физической культуры*, 2, 55–61.
38. Синявский, Н. И., Власов, В. В Сергеев, К. В. (2009). Мониторинг физической подготовленности детей младшего школьного возраста Среднего Приобья. *Физическая культура: воспитание, образование, тренировка*, 3, 31–32.

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