Physical activity of 7-10 year-old primary schoolchildren in northern region

UDC 796.011.3

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Abstract

Objective of the study was to profile the daily/ weekly physical activity of the northern primary schoolchildren sample.

Methods and structure of the study. We sampled for the study the 1-4-year (7-10 years old) primary schoolchildren (n=1342) qualified with the main health group from the Surgut and Nefteyugansk cities and Surgut Province in the Khanty-Mansi Autonomous Yugra area, whose daily/ weekly physical activity was rated using pedometers. The primary test data in movement numbers (locomotor units) were processed to produce empirical curves i.e. the daily/ weekly physical activity profiles. The physical activity profiles were found dependent on the individual living conditions, sports trainings and school studies. Based on the physical activity data analysis, the sample was grouped into the low, moderate, high and excessive physical activity ranks/ subgroups, with the relevant locomotor units limits.

Results and conclusion. Our study of the 7-10-year-olds' daily/ weekly physical activity profiles in the Khanty-Mansi Autonomous Yugra area found a few regularities. On the whole, the daily/ weekly physical activity rating tests are recommended for research as they give stable data, conditional on gender-unspecific daily regimen being stable enough (with scheduled sports trainings, school physical activity classes and other studies without absenteeism). The study grouped the sample into the low, moderate, high and excessive physical activity / functionality ranks/ subgroups, with every of them tested with its specific daily/ weekly physical activity profiles. Our correlation analysis found the daily/ weekly physical activity being gender-specific, with the boys groups showing significantly higher physical activity in every functionality subgroup.

Keywords: *physical activity, primary schoolchildren, Northern region.*

Background. The social policies being pursued by the Russian Federation give a special priority to the healthy lifestyle promotion and health improvement ones that imply a focused support for every popular physical activity format. Primary school age is commonly considered a highly favorable period for the physical education and sporting agenda formation in multiple physical activity formats [3]. This age offers great opportunities and motivations for everyday physical practices, outdoor games and sports, with a special role played by the national, traditional and ethnic games and competitions as the most affordable and effective physical activation and progress facilitation tools.

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Methods and structure of the study. We sampled for the study the 1-4-year (7-10 years old) primary schoolchildren (n=1342) qualified with the main health group from the Surgut and Nefteyugansk cities and Surgut Province in the Khanty-Mansi Autonomous Yugra area, whose daily/ weekly physical activity was rated using pedometers. The primary test data in movement numbers (locomotor units, LU) were processed to produce empirical curves i.e. the daily/ weekly physical activity profiles. The physical activity profiles were found dependent on the individual living conditions, sports trainings and school studies. Based on the physical activity data analysis, the sample was grouped into the low (LPA), moderate (MPA), high (HPA) and excessive physical activity (EPA) ranks/ subgroups, with the relevant locomotor units (LU) limits.

Table 1. *Northern primary schoolchildren daily physical activity test data (M±m)*

Physical activity intensity rank	Girls	Boys	p
Low, LPA	2578,2±228,1	4656,3±274,6	<0,05
Moderate, MPA	5839,1±265,7*	8633,5±202,4•	<0,05
High, HPA	11459,1±235,2**◊	15469,6±237,5•• ♦	<0,05
Excessive, EPA	13785,4±303,1□◊◊	19956,7±323,9■♦♦	<0,05

*Note: data difference significance (p<0.05) in the girls group for: *LPA vs MPA; **LPA vs HPA; □ HPA vs EPA; ◊ MPA vs HPA; ◊◊ HPA vs EPA; and in the boys group for: •LPA vs MPA; •• LPA vs HPA; ■ LPA vs EPA; ♦ MPA vs HPA; and ♦♦ HPA vs EPA*

Table 2. *Northern primary schoolchildren weekly physical activity test data (M±m)*

Physical activity intensity rank	Girls	Boys	p
Low, LPA	18539,2±822,4	34685,4±889,5	<0,05
Moderate, MPA	41367,6±892,7*	63743,3±832,2•	<0,05
High, HPA	82256,5±956,0**◊	111238,0±903,6•• ♦	<0,05
Excessive, EPA	99372,8±963,3□◊◊	140809,4±996,9■♦♦	<0,05

*Note: data difference significance (p<0.05) in the girls group for: *LPA vs MPA; **LPA vs HPA; □ HPA vs EPA; ◊ MPA vs HPA; ◊◊ HPA vs EPA; and in the boys group for: •LPA vs MPA; •• LPA vs HPA; ■ LPA vs EPA; ♦ MPA vs HPA; anδ ♦♦ HPA vs EPA*

Results and discussion. As defined by V.K. Balsevich [1], physical activity is the "purposeful individual motor actions geared to improve some aspects of the individual physical resource and/ or master athletic/ physical education skills or values". Physical activity optimization goal is interpreted in this context as the "most favorable physicality and functionality levels that secure an adequate quality of life" [2]. The efforts to optimize the northern primary schoolchildren physical activity need to be designed, managed and customized based on the daily/ weekly physical activity testing and profiling studies. Given in Table 1 hereunder are daily physical activity test data we obtained.

Based on the physical activity tests, we classified the girls and boys groups into the physical activity intensity ranks/ subgroups. The physical activity was found gender-specific, with every boys subgroup tested with the higher daily averages (p <0.05) versus the girl peers. Daily physical activity variation in the girls group was typically low till 12.00 with a peak around 14.00 and a gradual fall thereafter till 22.00. The daily physical activity curve was flatter for the boys low physical activity subgroup; whilst the boys high and excessive physical activity subgroups were tested with the relatively high physical activity in the evenings (18.00 to 20.00) – apparently due to the sports trainings. Given in Table 2 hereunder are the primary schoolchildren weekly physical activity test data we obtained.

The average group physical activity rates were found to vary by the intensity ranks. The boys/ girls low physical activity subgroup showed a gradual fall of the locomotor units

by the mid-week (Wednesday for boys and Thursday for girls) followed by growth on weekends. Both gender groups were tested with a steady locomotor units growth on Monday to Thursday followed by a fall on Friday with a slight growth on Sunday. The high and excessive physical activity subgroups with their high locomotor units showed a gradual physical activity fall by Saturday with a slight growth on Sunday.

The study data and analysis found the low physical activity subgroup with its low weekly locomotor units activating on weekends to reach the healthy weekly physical activity total; whilst the high and excessive physical activity subgroups, on the contrary, tend to reduce the physical activity on weekends to recover from the prior high physical and mental stresses.

Conclusion. Our study of the 7-10-year-olds' daily/ weekly physical activity profiles in the Khanty-Mansi Autonomous Yugra area found a few regularities. On the whole, the daily/ weekly physical activity rating tests are recommended for research as they give stable data, conditional on gender-unspecific daily regimen being stable enough (with scheduled sports trainings, school physical activity classes and other studies without absenteeism). The study

grouped the sample into the low, moderate, high and excessive physical activity / functionality ranks/ subgroups, with every of them tested with its specific daily/ weekly physical activity profiles. Our correlation analysis found the daily/ weekly physical activity being gender-specific, with the boys groups showing significantly higher physical activity ($p<0.05$) in every functionality subgroup.

References

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