

SECULAR TRENDS IN PHYSICAL DEVELOPMENT AND MOTOR PERFORMANCE OF PRESCHOOL CHILDREN (THEORETICAL BACKGROUND)

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Abstract

The main aim of this paper is to record the theoretical and methodological background in the evaluation of secular trends in physical development and motor performance. The paper analyzed the published evidence from foreign and domestic studies. International studies from the last period of secular trends indicate dangerous. The Czech population of children last true representative of the study was conducted in 1987 and focused on comparing the results with the year 1966th. After 1987, no longer available for the Czech population is sufficiently representative of studies dealing with secular trends in physical development and motor performance. Communication is the theoretical basis for research, a representative of secular trends in physical development and motor performance in children aged 11-15 years who currently runs on 13 randomly selected primary schools in region.

Introduction

Lifestyle of the current generation changes adversely affecting somatic and motor development of the current population of children of school age. Sedentary way of life influences a significant percentage of youth. The reasons are socio-economic changes in the developed world and the associated increases watching TV, playing computer games, unhealthy eating habits, etc. This trend leads to a reduced level of physical activity, this means increases physical inactivity of children and youth. Many international studies from the last period indicate dangerous secular trends (Tremblay and Willms, 2001, Katsunori, 2006; Tomkinson et al., 2007). Based on the data collected there can be observed changes from predominantly positive trends, or no secular trends in motor performance of young people from developed countries in the eighties to the negative direction of development today. This trend is most evident in the aerobic capacity, which is one of the most important components of health related fitness, it helps reduce the risk of cardiovascular disease, obesity, diabetes and other health problems in adulthood. In terms of power capabilities there have been reported different results from the positive trend in the static strength, which was associated with an increase in physical parameters, through unchanged performance of the power endurance in both sexes to predominantly negative secular trend in explosive-strength abilities at school age girls. The running speed tests on the boys, observed predominantly a zero trend, while the girls showed a clear negative secular trend of their performance. Eg. Tomkinson et al. (2007) reported a rapid decline in performance in endurance shuttle run test for the last twenty years in all analyzed 55 research studies from eleven countries. Another major finding, compared with national reference standards in each country, is a high increase in the percentage of children with an incidence of adverse body composition, this means higher

amount of body fat against active lean body mass. Excessive body weight brings with it many negative impacts on health - cardiovascular, respiratory, metabolic, etc. (Pavlik, Klárová, 2001 Suchomel, 2006).

1 The analysis of representative studies

1.1 Foreign studies

Based on data collected from studies in Poland, Norway, Denmark, Sweden, Japan, Canada, we can see the changes of secular trends in physical development and motor performance of young people from predominantly positive or no trends in the eighties to the negative direction of development today.

Polish author Przewedy (1994) found, in his research with more than 100 thousand children in the years 1979-1989, improved performance in most motor tests. This indicates that the level of physical fitness has increased despite a decline in daily physical activity. Subsequent measurements in 1999 showed the substantial deterioration in performance in many motor tests. The average performance actually fell down below the level from 1979 (Przeweda & Dobosz, 2005).

Norwegian authors warn against the decline in physical fitness and increase of somatic parameters at 9-year-old children. The testing was implemented between 2000 and 2006 (Steen - Johannessen et al., 2009). Similar changes were observed in the Danish study, where the authors observed gain body weight and reduced physical fitness in 1997-1998 compared with 1985 - 1986 of Danish children. The negative secular trends were more pronounced in boys than in girls (Wedderkopp et al., 2004).

Swedish studies show a reduction in aerobic capacity and increased maximal static strength power of adolescents in 1995 compared with 1974. These changes may be partly influenced by lower levels of physical activity, which results in an increase in BMI in 1995 at the boys and girls (Westerstahl et al., 2002).

Japanese authors highlight the significant decline in physical fitness, especially aerobic abilities of youth. The level of physical fitness in both sexes at the same time continuously decreases with the decrease of time spent participating in and exercise and sport after the 80th years (Watanabe et al., 1998, Nishijima et al. 2003; Suchomel, 2006).

In Australia, took place in 1971, 1985 and 1997 extensive studies of the physical fitness of 10-11 year old children. Comparison of results from the 1985 and 1997 showed a significant reduction in the performance of Australian children in endurance and speed tests as well as increased their body weight and BMI (Suchomel, 2006).

Tremblay (2001) states that changes in society have created more opportunities for more sedentary work and the consumption of foods high in kilojoules, which may eventually lead to a gradual gain body weight. In a study in the years 1981 - 1996 showed an increase of body weight, body height and BMI of Canadian children aged 7-13.

1.2 Czech studies

Unfortunately at present we do not have enough information to evaluate secular trends in levels of physical development and motor performance in our school population. Recent representative studies took place in 1987 (Moravec and Kasa, 1990) and focused on comparing the results with the year 1966 (Pavek, 1977). When comparing the survey between 1966 and 1987, it is clear that boys and girls of school age have a positive secular trend in body height and body weight. When comparing motor tests, which were included in both

surveys, there are significantly higher average performances on standing broad jump tests and tests of throw the 2 kg ball. In the test run at 50 m showed zero secular trend.

Especially after the events of November 1989, in our society there were many social and economic changes which had a major impact on the younger generation.. Physical activity of children received strong competitors in many other activities for young people attractive. This leads to a gradual reduction in levels of physical activity from childhood (Suchomel, 2006).

These changes were recorded in the study conducted by Kopecký, 2002, and Přidalová (2008) in the Olomouc region. The study showed an increase of body height and body weight and no secular trend in speed and explosive power capabilities for girls at pubescent age. Table 1 records the results of the measured height of girls aged 7-15 years. Nationwide study was in 1966, and carried out between 1968 and 2002 and implemented in the Olomouc region. The results illustrated a positive secular trend in body height of girls (see Fig. 1) - (Kopecký, Přidalová, 2008).

Tab. 1 Body height (cm) of girls in 1966, 1968 and 2002

Age	1966			1968		2002		
	n	\bar{x}	SD	n	\bar{x}	n	\bar{x}	SD
6.51-7.50	849	123.64	5.50	-	-	36	124.74	5.01
7.51-8,50	943	129.01	5.91	-	-	59	129.86	5.86
8.51-9.50	1017	134.37	6.08	-	-	69	134.44	6.29
9.51-10.50	952	139.67*	6.89	-	-	74	141.51	6.86
10.51-11.50	1192	146.55*	7.54	-	-	63	148.68	7.15
11.51-12.50	1148	152.42	7.24	77	150.59	73	152.45	8.07
12.51-13.50	1117	157.42	6.32	70	156.52*	69	158.74	7.65
13.51-14.50	1067	160.67*	6.11	41	160.68*	66	162.97	6.86
14.51-15.50	1064	161.56**	5.74	73	161.65*	53	165.91	6.88

Legend: n = number, \bar{x} = diameter, SD = standard deviation, *p < 0,05, **p < 0,01

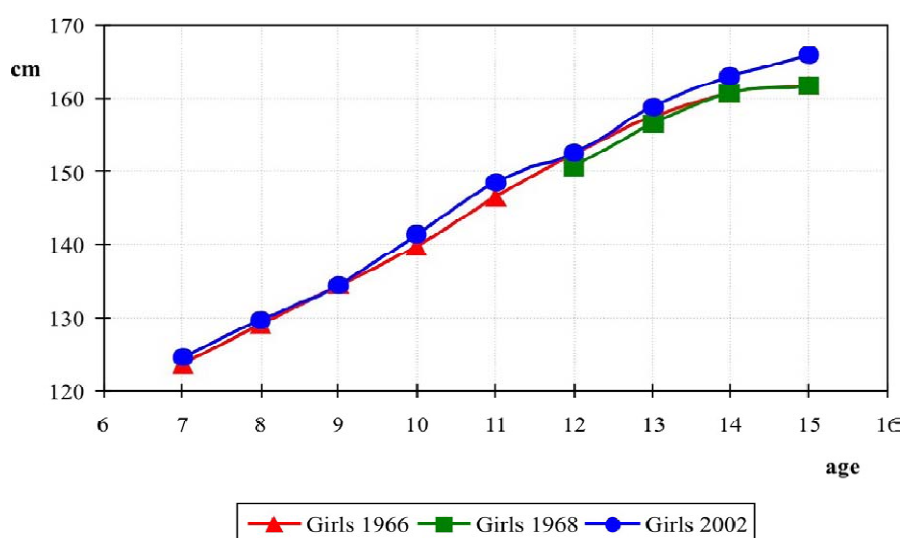


Fig. 1 Diagram of a positive secular trend of body height of girls

Conclusion

Given the above findings, we consider it important to identify and analyze the level of physical development and motor performance of school children and to identify secular trends over the past 45 years. Results obtained from the secular trend will be used to compare the strengths and weaknesses of the motor development of preschool children and for the creation of practical recommendations for the development of physical fitness skills in physical education in elementary schools.

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SEKULÁRNÍ TRENDY TĚLESNÉHO ROZVOJE A POHYBOVÉ VÝKONNOSTI DĚTÍ ŠKOLNÍHO VĚKU (TEORETICKÁ VÝCHODISKA)

Hlavním cílem příspěvku je zaznamenání teoretických a metodologických východisek při hodnocení sekulárních trendů tělesného rozvoje a motorické výkonnosti. V příspěvku jsou analyzovány publikované poznatky ze zahraničních a domácích studií. Zahraniční studie z posledního období naznačují nebezpečné sekulární trendy. U české populace dětí poslední skutečně reprezentativní studie proběhla v roce 1987 a zaměřila se na porovnání výsledků s rokem 1966. Po roce 1987 již nejsou pro českou populaci dostupné dostatečně reprezentativní výzkumy zabývající se sekulárními trendy tělesného rozvoje a motorické výkonnosti. Sdělení představuje teoretická východiska k reprezentativnímu výzkumu sekulárních trendů tělesného rozvoje a motorické výkonnosti u dětí ve věku 11-15 let, které v současné době probíhá na 13 náhodně vybraných základních školách libereckého regionu.

SÄKULERER TREND DER KÖRPERLICHEN ENTWICKLUNG UND MOTORISCHEN LEISTUNGSFÄHIGKEIT VON KINDERN IM SCHULALTER (THEORETISCHER HINTERGRUND)

Das Hauptziel dieses Beitrags ist die Feststellung von theoretischen und methodologischen Ausgangspunkten bei der Bewertung von säkularen Trends der körperlichen Entwicklung sowie den motorischen Leistungen. Der Beitrag analysiert die veröffentlichten Befunde von aus- und inländischen Studien. Die Auslandstudien der letzten Zeit zeigen die gefährlichen säkularen Trends. Bei tschechischen Kindern wurde 1987 die letzte Studie durchgeführt und mit den Ergebnissen aus dem Jahr 1966 verglichen. Nach 1987 finden sich keine ausreichenden repräsentativen Untersuchungen, die sich mit den säkularen Trends der körperlichen Entwicklung und motorischen Leistungen auseinandersetzen. Dieser Bericht stellt den theoretischen Grundstein zur repräsentativen Forschung von säkularen Trends der körperlichen Entwicklung und motorischen Leistungen bei Kindern im Alter von 11-15 Jahren dar. Diese Untersuchung verläuft in dieser Zeit an 13 zufällig ausgesuchten Grundschulen in der Region von Liberec.

TRENDY SEKULARNE ROZWOJU FIZYCZNEGO I SPRAWNOŚCI RUCHOWEJ DZIECI W WIEKU SZKOLNYM (TEORETYCZNE PRZESŁANKI)

Głównym celem artykułu jest prezentacja teoretycznych i metodologicznych przesłanek do oceny sekularnych trendów rozwoju fizycznego i sprawności motorycznej. W artykule przedstawiono analizę opublikowanej wiedzy z opracowań zagranicznych i krajowych. Opracowania zagraniczne z ostatniego czasu wskazują na niebezpieczne trendy sekularne. W przypadku czeskiej populacji dzieci faktycznie reprezentatywne badania przeprowadzono w 1987 roku, które dotyczyły porównania wyników z 1966 rokiem. Po 1987 roku dla czeskiej populacji nie ma już dostępnych wystarczająco reprezentatywnych badań poświęconych trendom sekularnym rozwoju fizycznego i sprawności motorycznej. Opracowanie przedstawia teoretyczne założenia badań reprezentatywnych trendów sekularnych rozwoju fizycznego i sprawności motorycznej dzieci w wieku 11-15 lat, które są obecnie prowadzone w 13 losowo wybranych szkołach podstawowych z regionu libereckiego.