SOMATIC PARAMETERS OF CHILDREN WITH LOW AND HIGH LEVELS OF MOTOR PERFORMANCE

Aleš Suchomel

Department of Physical Education, Faculty of Education,
Technical University of Liberec, the Czech Republic

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Abstract:

The aim of the present study was to analyse the relationship between selected somatic parameters and motor performance of prepubescent and pubescent boys and girls (8-9 and 12-13 years of age) with significantly over the average and under the average results in the whole score of the test battery UNIFITTEST (6-60). The analysis of the somatic parameters did not show any significant differences in the figures showing the body height among the groups of the same age, sex and different motor efficiency (eight groups contained from 19 to 25 children). But, on the other hand, in body weight, in body mass index and mostly in the amount of subcutaneous fatty tissue we obtained significantly higher results in the group with a low level of motor efficiency. In the groups with high motor efficiency, we found a closer relation to somatic characteristics (body weight, body mass index, the amount of subcutaneous fatty tissue), which was expressed by a significantly lower variability of the results compared to the low motor efficiency groups. The results confirmed the necessity of somatic parameters determination in the selection of children talented for sports. On the other hand, they showed us a tendency to an ambiguous relation between the basic somatic characteristics and a low level of motor efficiency.

Key words: *somatic profile, children, motor performance*

SOMATISCHE PARAMETER DER KINDER MIT NIEDRIGEM UND HOHEM NIVEAU DER MOTORISCHEN LEISTUNGSFÄHIGKEIT

Zusammenfassung:

Das Ziel dieser Untersuchung war, die Beziehungen zwischen den ausgewählten Charakteristiken des Körperbaus und der motorischen Leistungsfähigkeit der Jungen und Mädchen im Alter von 8 bis 9 und 12 bis 13 Jahren mit unter- und überdurchschnittlichen Leistungen im gesamten Ergebnis der Testbatterie UNIFITTEST zu analysieren. Hinsichtlich der Körperhöhe wurden keine signifikanten Unterschiede unter den Gruppen der Gleichaltrigen, zwischen den Jungen und Mädchen und den motorisch Unter- und Überdurchschnittlichen, festgestellt. Im Gegenteil, dazu wurden im Körpergewicht und im BMI-Index, und besonders in der Menge des Unterhautfettgewebes signifikant höhere Werte in den Gruppen mit unterdurchschnittlicher motorischer Leistungsfähigkeit festgestellt. In den Gruppen mit überdurchschnittlicher motorischer Leistungsfähigkeit wurde eine signifikant niedrigere Variabilität des Körpergewichts, des BMI-Index und vor allem des Unterhautfettgewebes als in den Gruppen der Unterdurchschnittlichen verzeichnet. Die resultierenden Werte haben die Notwendigkeit der Berücksichtigens von somatischen Kennziffern bei der Auswahl der Sporttalente bestätigt. Andererseits haben sie die Tendenz zu uneindeutigen Beziehungen der grundsomatischen Charakteristiken zu niedrigem Niveau der motorischen Leistungsfähigkeit gezeigt.

Schlüsselwörter: *somatisches Profil, Kinder, motorische Leistungsfähigkeit*

Introduction

Since the 1970s, many studies of the relation between the somatic characteristics and motor performance of Czech children and youth have been done (e.g., Chytráčková, 1996; Kopecký, 2004; Medeková, 2002; Měkota, Kovář, Chytráčková, Kohoutek, Gajda, & Moravec, 1995; Moravec, 1990; Štěpnička, 1987; Suchomel, 2003; etc.). According to their published findings, we can see that the somatic characteristics (especially at the pubescent

age) are in some relations with motor test efficiency, particularly in physical condition tests. The amount of subcutaneous fatty tissue is an important characteristic because it seems to be a highly negatively limiting factor, which causes low motor efficiency in the end.

Analysing literary sources very carefully (Docherty, 1996; Chytráčková, 1996; Jürimäe & Jürimäe, 2001; Malina & Beunen, 1995; Malina, Bouchard, & Bar-Or, 2004; Mészáros, Chee Pheng, Tatár, Zsidegh, Mohácsi, & Frenkl, 2002; Moravec, Kampmiller, & Sedláček, 1996; Saar & Jürimäe, 2001; Welk, Morrow, & Falls, 2002) we can see that the discovered relations between the somatic characteristics and motor efficiency of school-aged children are not unambiguous and the calculated extent of correlation coefficients is quite large. A comparison of the obtained findings is very often complicated because of the problematic assessment of the significance of the calculated correlation coefficients. The calculated statistically significant difference does not often mean any logically significant difference, which is particularly valid for larger groups.

The aim of the study was to determine the relations between the selected somatic characteristics and motor performance of school-aged boys and girls (8-9 and 12-13 years of age) who had a considerably above-average and considerably below-average total score of the test battery UNIFITTEST (6 - 60) (Měkota et al., 1995; Chytráčková, 2002). On the basis of analysing the published findings of other researchers, we hypothesize that the groups of pubescent children of identical sex and of different motor efficiency will significantly differ in somatic characteristics directly or indirectly related to body weight, in body mass index and in the amount of subcutaneous fatty tissue. We also suppose that in the groups with a high motor efficiency, we will find a closer relation to the somatic characteristics, which will be expressed by a significantly smaller variability of all the values than in the groups with low motor efficiency.

Methods

Subjects

The representative sample, which participated in the motor performance tests, consisted of 253 boys and 267 girls aged 8-9, 247 boys and 262 girls aged 12-13 years. All of them came from the Liberec region in the Czech Republic. No children having any health limitation or attending specialised sports schools were included in the representative group. On the basis of all the participants' test results, we selected:

a) individuals with a low motor efficiency whose total test scores were 1.5 SD (standard deviation) below the average value (14 points and less) – four groups contained 19-25 children.
b) individuals with a high motor efficiency whose total test scores were 1.5 SD above the average value (30 points and more) – four groups contained 17-23 children.

In the framework of our research of basic motor efficiency of school-aged children we decided to use the standardised test battery UNIFITTEST (6-60) (Měkota et al., 1995; Chytráčková, 2002). For prepubescent and pubescent individuals it contains four motor tests - standing broad jump, sit-ups in 60 seconds, endurance shuttle run or 12-minute run, and the shuttle 4 x 10 m run. The total score of the battery is expressed by the sum of four point values (the extent is 4 - 40 points, the theoretical average value is 22 points and the standard deviation is 5 points).

Methods of data analysis

In all subjects with either a high or low motor efficiency we measured thirteen basic somatic characteristics - body height, body weight, biacromial width, bispinal width, width of the distal humoral epiphysis, width of the distal femoral epiphysis, circumference of the contracted arm, maximum circumference of the forearm, median circumference of the thigh, maximum circumference of the calf, suprailiacal skinfold, triceps skinfold, and subscapular skinfold. The skinfolds were measured with a calliper of the Harpenden type (produced by SOMET, the accuracy of measurement is 0.1 mm). The somatic characteristics were measured in a standard way, according to the method by Martin and Saller (Knussmann, 1988).

Subsequently, we calculated the weight-height indices: body mass index [BMI = body weight (kg) / body height^2 (m)] and Rohrer's index, the amount of subcutaneous fatty tissue and normalised indices. To assess the amount of subcutaneous fatty tissue, we used the sum of the three specified skinfolds and its subsequent comparison with the values of the five-point norms by Chytráčková (2002).

Because of the size of our groups and the way of their selection, we used the boxplots to project the basic statistical characteristics graphically. A boxplot is a graph the span of which is equal to 50 percent of all the cases and a graph in which the median value is presented.

The medians of the measured somatic characteristics of all the researched groups were compared with the normative values of the Czech population. It was done via the so-called normalised indices (NI). The NI values of body height, body weight, BMI and Rohrer's index were calculated on the basis of the fifth nation-wide anthropological research in 1991 (Lhotská, Bláha, Vignerová, Roth, & Prokopec, 1993). Other NI values of the rest of the

somatic characteristics were calculated on the basis of the findings of anthropological research, which was done during the Czechoslovak Spartakiad in 1985 (Bláha, Šedivý, Čechovský, & Kosová, 1986; Bláha, Komenda, Kosová, & Riegerová, 1987). All the calculated NI values were entered into graphical grids - so called somatic profiles.

We used the Kruskal-Wallis test (K-W test) with subsequent pair comparison to test the significance of the difference of the result values. For a graphical projection of the calculated percent values, we used column graphs.

Mathematical-statistical data processing was done using the software of the EpiInfo version 5.01a (Centers for Disease Control, Atlanta, U.S.A. and WHO, Geneva, Switzerland, 1991) and the S-PLUS version 4.0 (Data Analysis Products Division, Math Soft, Inc., Seattle, Washington, U.S.A., 1997). The data of the somatic characteristics were processed by using the anthropological software ANTROPO version 98.1 (author Pavel Bláha – ANTROBLA, 1998) and the software for monitoring growth and development of children RŮST2 (author Petr Lesný – NOVO NORDISK, 1997).

Results

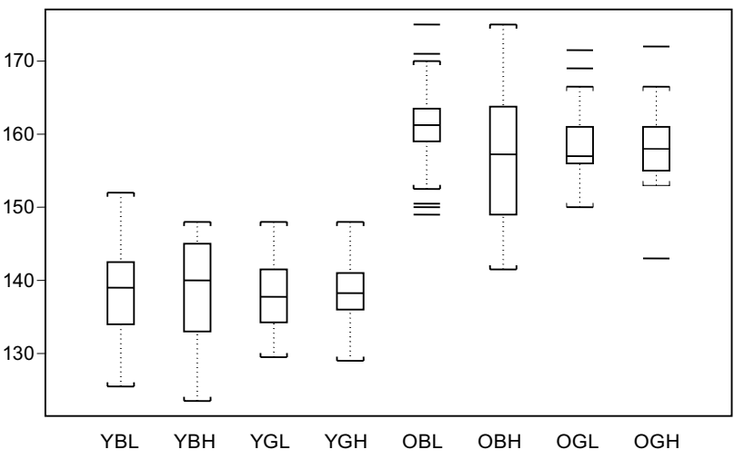
In the four boxplots (Figures 1 - 4) we can see the result values of the low-fit and high-fit subjects - body height, body weight, BMI and the sum of three skinfolds.

In figures 5 and 6 we can see the percent occurrence of the low-fit and high-fit individuals in the categories of the five-grade norms of the sum of three skinfolds (Chytráčková, 2002).

Somatic profiles of the prepubescent and pubescent subjects are presented in figures 7 and 8.

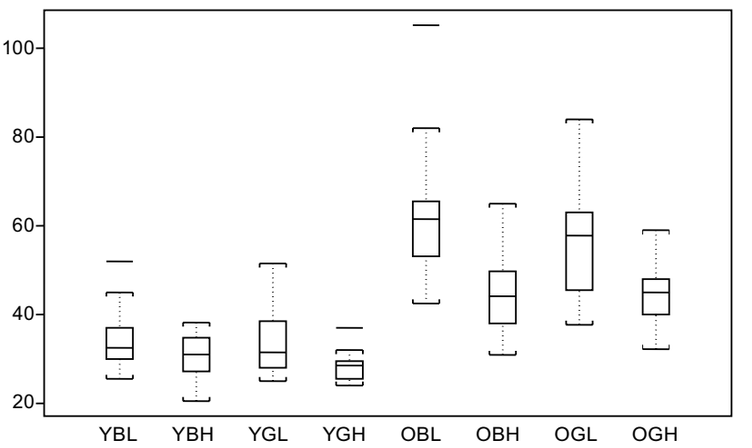
Discussion and conclusions

Assessing the graph of body heights (Figure 1), we can see there is a significant tendency towards a higher variability of the values in the male subjects and a lot of remote values in the pubescent groups, particularly in low-fit boys. The graph also shows that, as we supposed, there are logically significant differences between the prepubescent and pubescent subjects. On the other hand, considering the level of motor efficiency, we did not find any logicaly significant differences of the medians of body heights in both the younger and the older groups. This was statistically confirmed by the result of the K-W test ($119.12 > \chi^2_{0.01;7}$ - chi square at the 0.01 significance level, 7 degrees of freedom) and by subsequent comparison of pair values. The finding that body height is in no relation to the level of motor



Legend: YBL = prepubescent boys with low motor efficiency; YBH = prepubescent boys with high motor efficiency; YGL = prepubescent girls with low motor efficiency; YGH = prepubescent girls with high motor efficiency; OBL = pubescent boys with low motor efficiency; OBH = pubescent boys with high motor efficiency; OGL = pubescent girls with low motor efficiency; OGH = pubescent girls with high motor efficiency.

Figure 1. Boxplot of body height [cm].



Legend: YBL = prepubescent boys with low motor efficiency; YBH = prepubescent boys with high motor efficiency; YGL = prepubescent girls with low motor efficiency; YGH = prepubescent girls with high motor efficiency; OBL = pubescent boys with low motor efficiency; OBH = pubescent boys with high motor efficiency; OGL = pubescent girls with low motor efficiency; OGH = pubescent girls with high motor efficiency.

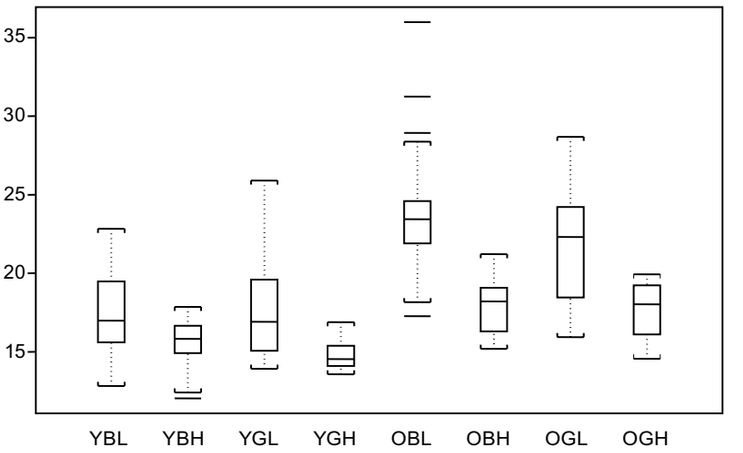
Figure 2. Boxplot of body weight [kg].

efficiency corresponds with the findings of the studies of children with average motor efficiency (Docherty, 1996; Moravec, Kampmiller, & Sedláček, 1996).

The boxplot of the result values of body weight (Figure 2) shows significant variability of the values in the pubescent subjects, particularly in both the low-fit groups. In the relation to the level of motor efficiency, in the prepubescent groups, there is no logically significant difference between the values of body weight of the low-fit and high-fit subjects. On the other hand, in the pubescent groups there is a logically significant difference of the median values of body weight in relation to the different levels of motor efficiency (the boys' difference is 17.35 kg; the girls' difference is 12.90 kg and there are higher values in the low-fit subjects). Calculation of the K-W test ($117.83 > \chi^2_{0.01;7}$) confirmed statistically significant differences between the subjects at the 0.01 level.

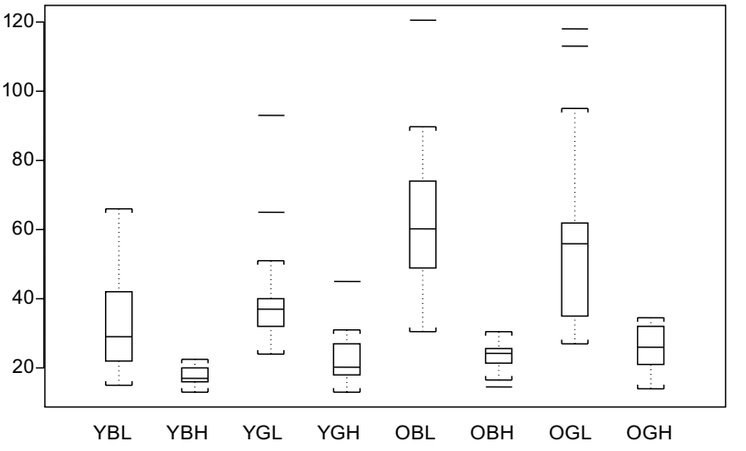
Similar results to the findings connected with body weight were found in the BMI area (Figure 3). The boxplot shows considerably higher variability of the values in the low-fit subjects. In the relation between BMI and the level of motor efficiency, we did not find any logically significant differences of the BMI values in the prepubescent groups. On the contrary, we found a logically significant difference of the mean BMI values of the pubescent low-fit and high-fit groups. In all the cases, there are higher values in the low-fit subjects (the boys' difference is 5.23 kgm^{-2}; the girls' difference is 4.28 kgm^{-2}). Calculation of the K-W test criterion ($90.03 > \chi^2_{0.01;7}$) confirmed a statistically significant difference between the values at the 0.01 level.

The boxplot of the sum of the 3 skinfolds (Figure 4) apparently shows great variability of the values in the low-fit groups, which corresponds to the above mentioned findings about the BMI values. Variability of the values considerably increases with age; and additionally, in the low-fit pubescent subjects, it reaches quite large values. However, in all the high-fit groups, we recorded quite equal values of the sum of the three measured skinfolds. The boxplot apparently shows the logically significant differences between the subjects of identical age and sex, and different levels of motor efficiency (higher values were in the low-fit subjects). Calculation of the K-W test ($113.09 > \chi^2_{0.01;7}$) confirmed statistically significant differences between the groups at the 0.01 level. According to the table of pair comparison (Table 1), we can see that in both age categories there are statistically significant differences of the sums of the three skinfolds of the subjects with different levels of motor efficiency in



Legend. YBL = prepubescent boys with low motor efficiency; YBH = prepubescent boys with high motor efficiency; YGL = prepubescent girls with low motor efficiency; YGH = prepubescent girls with high motor efficiency; OBL = pubescent boys with low motor efficiency; OBH = pubescent boys with high motor efficiency; OGL = pubescent girls with low motor efficiency; OGH = pubescent girls with high motor efficiency.

Figure 3. Boxplot of BMI [kgm^{-2}].



Legend. YBL = prepubescent boys with low motor efficiency; YBH = prepubescent boys with high motor efficiency; YGL = prepubescent girls with low motor efficiency; YGH = prepubescent girls with high motor efficiency; OBL = pubescent boys with low motor efficiency; OBH = pubescent boys with high motor efficiency; OGL = pubescent girls with low motor efficiency; OGH = pubescent girls with high motor efficiency.

Figure 4. Boxplot of the sum of three skinfolds [mm].

Table 1. Pair comparison of the values of the sum of three skinfolds (the Kruskal-Wallis test)

	YBL	YBH	YGL	YGH	OBL	OBH	OGL
YBL							
YBH	***						
YGL		***					
YGH			**				
OBL	*	***		***			
OBH			*		***		
OGL		***		***		***	
OGH					***		**

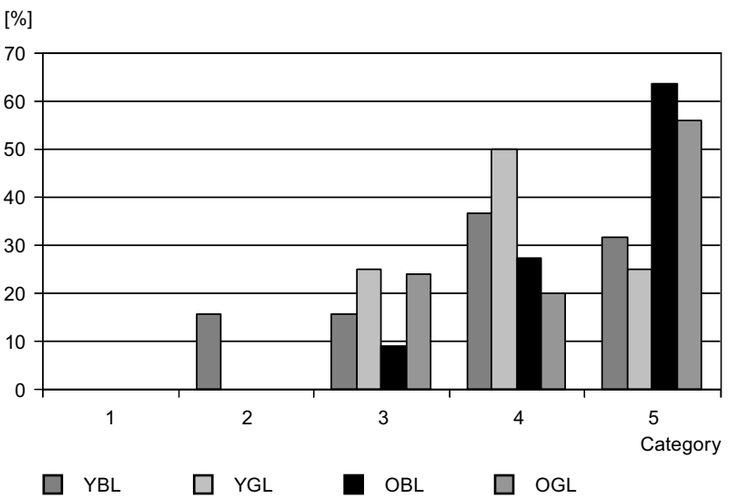
Legend. YBL = prepubescent (younger, aged 8-9) boys with low motor efficiency; YBH = prepubescent boys with high motor efficiency; YGL = prepubescent girls with low motor efficiency; YGH = prepubescent girls with high motor efficiency; OBL = pubescent (older, aged 12-13) boys with low motor efficiency; OBH = pubescent boys with high motor efficiency; OGL = pubescent girls with low motor efficiency; OGH = pubescent girls with high motor efficiency; the levels of statistical significance: *** = 0.01, ** = 0.05, * = 0.10.

the boys' groups at the 0.01 level and in the girls at the 0.05 level. This finding corresponds with the other researchers' findings that the amount of subcutaneous fatty tissue has a negative influence on school-aged children's level of motor efficiency (Jürimäe & Jürimäe, 2001; Malina, Bouchard, & Bar-Or, 2004; Moravec, Kampmiller, & Sedláček, 1996; Raudsepp & Jürimäe, 1997; Welk, Morrow, & Falls, 2002).

In the categories of the five-grade norms of the sum of three skinfolds (Figure 5 and 6) most of the results in all the high-fit groups belong to the 3rd category of average values; and moreover, almost all the values belong to the interval from the 1st category (very small values) to the 3rd category (average values). The prepubescent low-fit individuals have the highest relative frequency of their values in the 4th category of above-average values and the pubescent low-fit individuals have it even in the 5th category of very high values. Almost all the values of the low-fit groups belong to the interval from the 3rd to the 5th category of the five-grade norms. It means the older the low-fit individuals are, the higher values of the amount of subcutaneous fatty tissue they have.

According to the prepubescent individuals' somatic profiles (Figure 7), we can say that the majority of the assessed NI somatic characteristics belong to the zone of average values. The NI values of the low-fit subjects are positive values of the average and above-average zones. The NI values of the high-fit subjects belong to the whole zone of average values, but the values of BMI and Rohrer's index belong to the below-average zone. As for the assessed characteristics, the measured prepubescent low-fit and high-fit subjects are similar to the normal population, apart from one exception where there is a tendency to higher values of subcutaneous fatty tissue in the low-fit groups. We have not proved any inter-sexual differences between the median values of somatic characteristics of the subjects with the same level of motor efficiency.

The somatic profile of the pubescent subjects (Figure 8) shows significant differences of the NI somatic characteristics (excluding body height) of the low-fit and high-fit groups. The NI values of both the high-fit groups also belong to the average zone; however, in this case, it is much more significant than in the prepubescent groups because the average zone is equal only to ± 0.75 SD. The NI values of both the low-fit groups are characterised to quite a large extent - the body height values belong to the higher value area of the average zone, but the NI values of skinfolds are extremely above-average, especially in the male subjects. As for the somatic characteristics, the measured pubescent high-fit subjects do not significantly differ from the population's values in the following characteristics: body weight, weight-height indices, width and circumference characteristics and especially the amount of subcutaneous fatty tissue (in all the cases, it is more significant in the male group). We have not found any inter-sexual differences between the

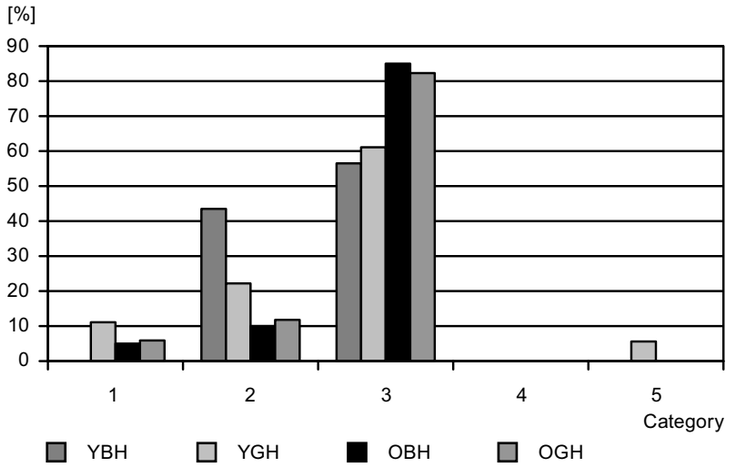


Legend. YBL = prepubescent boys with low motor efficiency; YGL = prepubescent girls with low motor efficiency; OBL = pubescent boys with low motor efficiency; OGL = pubescent girls with low motor efficiency.

Figure 5. Distribution of low motor efficiency individuals in the categories of the norm of the sum of three skinfolds.

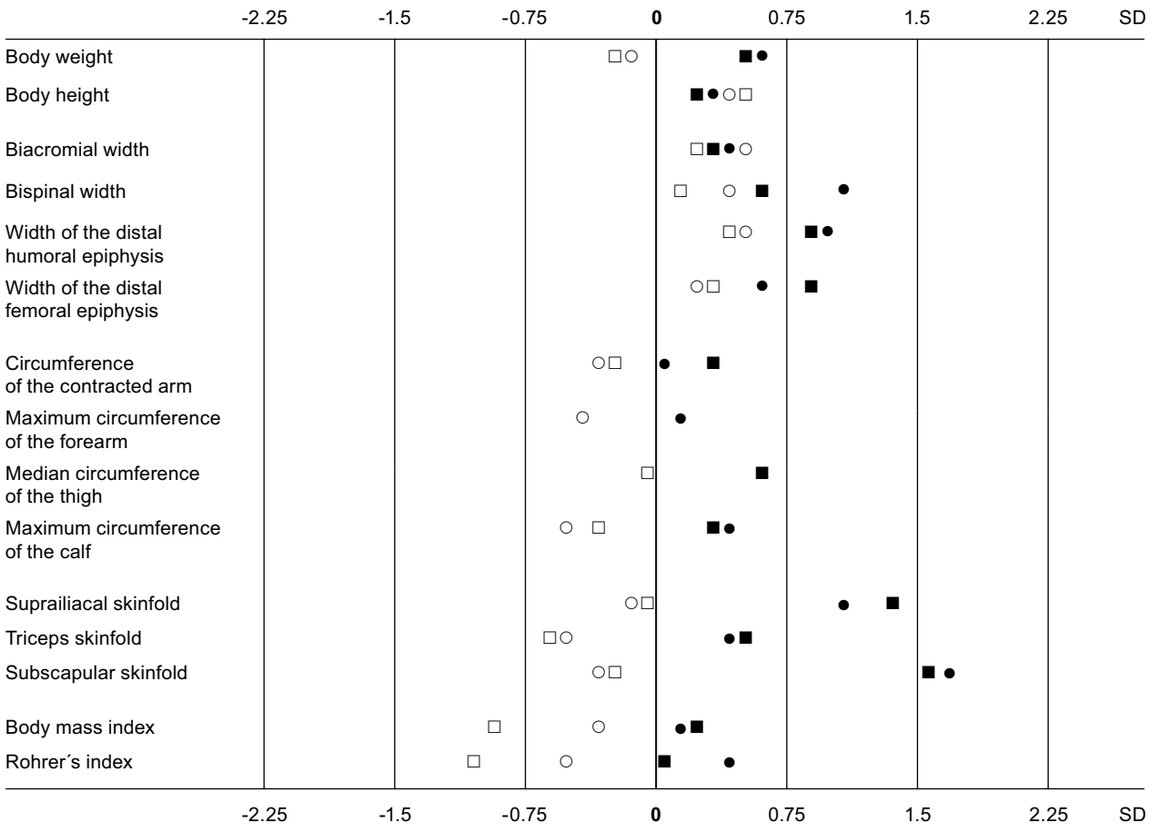
median values of both the high-fit groups. In all the cases, there are lower NI values in the female high-fit group. In both the low-fit groups, the NI values tend to be above-average (the only exception in both the cases is average body height). Higher NI values are in the male low-fit group (compared to the female low-fit group). The NI values of pubescent girls with a low level of motor efficiency belong to the above-average zone, except for the considerably above-average values of the skinfolds. On the other hand, the NI values of pubescent boys with a low level of motor efficiency are considerably above-average, except for the above-average values of the biacromial width.

There are no logically and statistically significant differences in the values of body height between



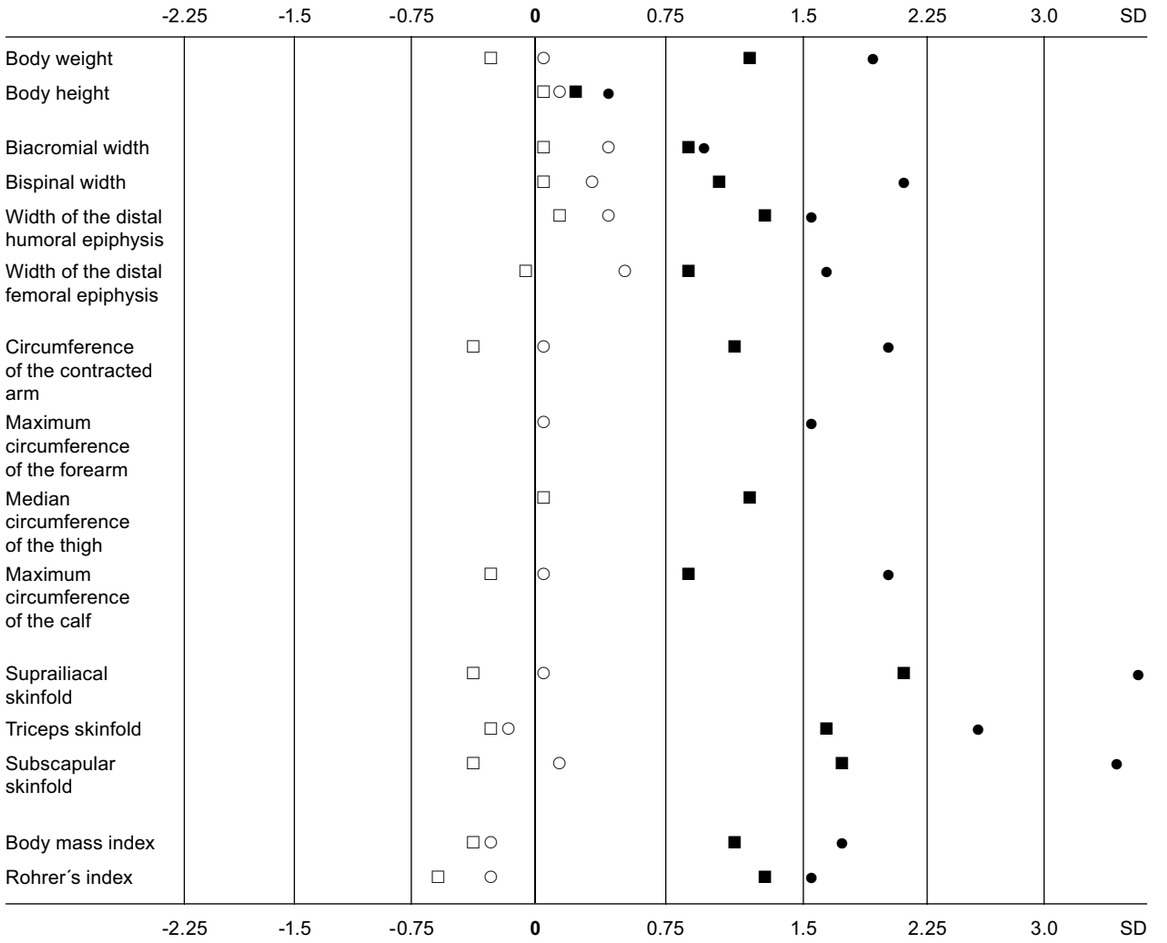
Legend. YBH = prepubescent boys with high motor efficiency; YGH = prepubescent girls with high motor efficiency; OBH = pubescent boys with high motor efficiency; OGH = pubescent girls with high motor efficiency.

Figure 6. Distribution of high motor efficiency individuals in the categories of the norm of the sum of three skinfolds.



Legend: ● = boys with low level of motor efficiency (YBL); ○ = boys with high level of motor efficiency (YBH); ■ = girls with low level of motor efficiency (YGL); □ = girls with high level of motor efficiency (YGH); SD = standard deviation.

Figure 7. Somatic profile of prepubescent individuals with low and high motor efficiency (the normalised indices of the medians of body characteristics).



Legend. ● = boys with low level of motor efficiency (OBL); ○ = boys with high level of motor efficiency (OBH); ■ = girls with low level of motor efficiency (OGL); □ = girls with high level of motor efficiency (OGH); SD = standard deviation.

Figure 8. Somatic profile of pubescent individuals with low and high motor efficiency (the normalised indices of the medians of body characteristics).

the subjects of identical age and sex, and different levels of motor efficiency. As for body weight and BMI, there are significantly higher values in the groups with low motor efficiency. The most logically and statistically significant differences are in the amount of subcutaneous fatty tissue. In all the cases, there are considerably higher values in the subjects with low motor efficiency. Comparing all the subjects, in the groups with high motor efficiency, we can find a closer relation to the somatic characteristics (body weight, BMI, and the amount of subcutaneous fatty tissue) than in the low motor efficiency subjects. This is expressed by a considerably lower variability of all the values. Finally, on the basis of all our findings, the set hypothesis has been confirmed.

The results confirmed the necessity of somatic parameter determination in the selection of children talented for sports. On the other hand they showed us the tendency towards an ambiguous relation between the basic somatic characteristics and the low level of motor efficiency.

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Correspondence to:
Prof. Aleš Suchomel, PhD
Department of Physical Education
Faculty of Education, Technical University of Liberec
Hálkova 6, 461 17 Liberec 1
The Czech Republic
Phone: + 420 48 5355126
Fax: + 420 48 5355120
E-mail: ales.suchomel@vslib.cz

SOMATSKI PARAMETRI DJECE S NISKOM I VISOKOM RAZINOM MOTORIČKIH SPOSOBNOSTI

Sažetak

Uvod

Pažljiva analiza brojnih literaturnih izvora otkriva da povezanost tjelesnih karakteristika i motoričkih sposobnosti djece školske dobi nije sasvim jasna, a izračunati korelacijski koeficijenti prilično su visoki. Usporedba dobivenih rezultata često je vrlo složena zbog dvojbenog određivanja značajnosti izračunatih korelacijskih koeficijenata. Izračunata statistički značajna razlika često ne predstavlja nikakvu logički značajnu razliku, što osobito vrijedi za veće uzorke.

Cilj istraživanja bio je utvrditi povezanost između odabranih tjelesnih karakteristika i motoričkih sposobnosti dječaka i djevojčica školske dobi (8-9 i 12-13 godina) koji su postigli značajno iznadprosječan, odnosno značajno ispodprosječan ukupni rezultat u bateriji testova UNIFITTEST (6 - 60) (Měkota, Kovář et al., 1995). Na temelju analize objavljenih rezultata drugih istraživača, postavili smo hipotezu da će se uzorci djece pubertetske dobi istog spola, ali različitih motoričkih sposobnosti značajno razlikovati u tjelesnim karakteristikama koje su izravno ili neizravno povezane s tjelesnom masom (tjelesna masa, indeks tjelesne mase i količina potkožnog masnog tkiva). Postavili smo i hipotezu da će u uzorcima s visokim motoričkim sposobnostima biti utvrđena veća povezanost s tjelesnim karakteristikama, izražena značajno manjom varijabilnošću svih vrijednosti u odnosu na uzorke s nižim motoričkim rezultatima.

Metode

U okviru straživanja o bazičnoj efikasnosti motoričkog ponašanja djece školske dobi, koristili smo se standardiziranom baterijom testova UNIFITTEST (6-60). Reprezentativni uzorak ispitanika, koji je sudjelovao u testovima motoričkih sposobnosti, sastojao se od 253 dječaka i 267 djevojčica u dobi od 8 do 9 godina te 247 dječaka i 262 djevojčice u dobi od 12 do 13 godina. Svi su ispitanici bili iz regije Liberec u Češkoj. U reprezentativni uzorak nisu bila uključena djeca sa zdravstvenim poteškoćama ni djeca polaznici specijaliziranih sportskih škola. Na temelju rezultata testova svih sudionika, odredili smo: a) ispitanike s niskom razinom motoričkih sposobnosti: njihovi ukupni rezultati testova bili su 1,5 standardnu devijaciju ispod prosječne vrijednosti (14 bodova i manje) – četiri uzorka obuhvaćala su od 19 do 25 djece; b) ispitanike s visokom razinom motoričkih sposobnosti: njihovi ukupni rezultati testova bili su 1,5 standardnu devijaciju iznad prosječne vrijednosti (30 bodova i više) – četiri uzorka obuhvaćala su od 17 do 23 djece.

U svih osam uzoraka izmjerili smo trinaest osnovnih somatskih karakteristika – tjelesnu visinu, tjelesnu masu, biakromijalni raspon, bispinalni raspon, širinu distalne humeralne epifize, širinu distalne femoralne epifize, opseg nadlaktice u fleksiji, najveći opseg podlaktice, srednji opseg natkoljenice, najveći opseg potkoljenice, suprailijakalni kožni nabor, kožni nabor nad tricepsom i subskapularni kožni nabor. Zatim smo izračunali indekse mase-visine: indeks tjelesne mase [BMI = tjelesna masa (kg) / tjelesna visina^2 (m)] i Rohrerov indeks, količinu potkožnog masnog tkiva i normalizirane indekse. Medijani izmjerenih somatskih karakteristika svih uzoraka ispitanika uspoređeni su s normativnim vrijednostima češke populacije. To je učinjeno pomoću tzv. normaliziranih indeksa. Sve izračunate vrijednosti normaliziranih indeksa unesene su u grafičke koordinatne mreže – tzv. somatske profile. Koristili smo Kruskal-Wallisov test s kasnijom usporedbom parova za testiranje značajnosti razlika između vrijednosti rezultata uzoraka. Za grafički prikaz izračunatih postotnih vrijednosti koristili smo grafove stupaca.

Rezultati, rasprava i zaključak

U četiri stupčana dijagrama prikazane su vrijednosti rezultata uzoraka s niskom i visokom razinom motoričkih sposobnosti – tjelesna visina, tjelesna masa, indeks tjelesne mase i zbroj tri kožna nabora. Analizom izmjerenih antropometrijskih karakteristika u uzorcima ispitanika iste dobi i spola, ali različitih razina motoričkih sposobnosti, nismo pronašli nikakvih logičkih ni statistički značajnih razlika u visini tijela ispitanika. S druge strane, utvrdili smo značajno veće vrijednosti tjelesne mase, indeksa tjelesne mase i, osobito, količine potkožnog masnog tkiva u uzorcima ispitanika s niskom razinom motoričkih sposobnosti. U uzorcima ispitanika s visokom razinom motoričkih sposobnosti utvrdili smo veći stupanj povezanosti tih sposobnosti sa somatskim karakteristikama (tjelesna masa, indeks tjelesne mase, količina potkožnog masnog tkiva), što je bilo izraženo u vidu značajno manje varijabilnosti rezultata u usporedbi s uzorcima ispitanika niže razine motoričkih sposobnosti.

Prema somatskim profilima ispitanika pretpubertetske dobi, možemo zaključiti da većina izračunatih normaliziranih indeksa somatskih karakteristika pripada rasponu prosječnih vrijednosti. Somatski profil uzoraka pubertetske dobi pokazuje značajne razlike u normaliziranim indeksima somatskih karakteristika (isključivši tjelesnu visinu) između uzoraka s niskom i visokom razinom motoričkih sposobnosti. Vrijednosti normaliziranih indeksa oba uzorka visoke razine motoričkih sposobnosti također pripadaju rasponu prosječnih vrijednosti. Vrijednosti normaliziranih indeksa oba uzorka s niskom razinom motoričkih sposobnosti karakterizirane su prilično velikim rasponom – vrijednosti tjelesne visine pripadaju višoj razini unutar raspona prosječnih vrijednosti, dok su vrijednosti normaliziranih indeksa kožnih nabora izrazito iznad prosjeka, osobito u uzorcima dječaka. U oba uzorka ispitanika s niskom razinom motoričkih sposobnosti, vrijednosti normaliziranih indeksa pokazuju tendenciju iznadprosječnih vrijednosti (jedina iznimka u oba slučaja je prosječna tjelesna visina).

Rezultati su potvrdili nužnost utvrđivanja somatskih parametara u selekciji djece talentirane za sport. S druge strane, pokazali su tendenciju prema nejasnom odnosu između osnovnih somatskih karakteristika i niske razine motoričkih sposobnosti.