Diagnostics of Motor Abilities in Primary School Pupils in the Hradec Králové and Pardubice Regions

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ABSTRACT

Motor fitness is seen as a prerequisite for efficient physical functioning of the body and contributes to an active lifestyle. The aim of the research was to use 4 motor tests (standing long jump; sit-up test; 4 × 10 m shuttle run; Leger test /Beep test/) (1) to assess the level of motor fitness in comparison with UNIFITTEST, (2) to assess the significance of the difference in performance between the sexes, and (3) to assess the current status of the mean values of body height (BH) and body weight (BW) with the values of the National Institute of Public Health's National Anthropological Research (NIPH's NAR), in CZ: Celostátní antropologický výzkum (CAV) Státního zdravotního ústavu (SZÚ). Testing was conducted among 2nd grade primary school students (boys: n=129; girls n=99) in the Hradec Králové and Pardubice Regions. Comparison with the UNIFITTEST values for boys showed average performance in the sit-up test, below-average performance in the standing long jump, 4 × 10 m shuttle run and Leger test. For girls, the comparison showed average performance in the sit-up test, below-average performance in the standing long jump and 4 × 10 m shuttle run tests, and significantly below-average performance in the Leger test. The results of the statistical analysis (Mann-Whitney U test, T-test, effect size) showed a significant difference between sexes in 4 × 10m run test ($p = 0.018$) and Leger test ($p = 0.041$); the magnitude of substantive significance (Cohen's d) was between small and medium effect ($d = 0.321$, resp. $d = 0.386$). Comparison of the mean BH and BW values of the pupils with the NIPH's NAR values showed that the pupils tested by us achieved lower BH and higher BW than the NIPH's NAR values: boys 131.5 cm (NIPH's NAR) × 127cm; 27 kg (NIPH's NAR) × 29.2 kg, girls 130 cm (NIPH's NAR) × 125.5 cm; 27kg (NIPH's NAR) × 27.7 kg.

Keywords: motor fitness, motor testing, younger school age, UNIFITTEST

FINANCIAL SUPPORT

The results of testing and measurements were processed with the support of grant competition of the University of Hradec Králové (UHK) for the use of grant funds for specific university research of the Ministry of Education, Youth and Sports (MŠMT) announced by the Faculty of Education, University of Hradec Králové No 2127/2020.

INTRODUCTION

Motor fitness has a demonstrable effect on health and contributes to the quality of life. These are the reasons why it is perceived as a significant value in human life. Influencing motor fitness through physical activities of school youth within physical education classes as well as creating a positive attitude in the context of whole human life is one of the basic goals of physical education across all grades of schools.

Motor development has an individual course and uneven pace during ontogenesis. According to Laigmeier and Krejčíková (2006), child's motor skills improve significantly during younger school age; in terms of motor fitness, the muscular strength increases significantly, aerobic performance increases too and there is also a gradual and substantial improvement in coordination skills. During this age and due to these facts, there is a growing interest in competitive sports activities, after-school sports clubs as well as spontaneous physical activities and games in which all the motor skills are developed depending on motivation, level of biological development of individuals and external conditions for carrying out physical activities – family, place of residence, etc. (Davison & Jago, 2009). Motor performance is not limited only by the age, but also by environmental influences which have to be positively influenced and children sufficiently supported. In such conditions, faster growth of motor skills is taking place depending on the type of physical activities of the individuals. Differentiation usually occurs with the level of support by parents or degree of success (good results or mastering skills), which increase internal motivation of children to get involved in physical activities. One of the key places is generally occupied by the level of motor fitness of young organism as well as individual motor skills as a basis for the implementation of motor activities. For the period of younger school age, Vágnerová (2012) formulates the so called early school age, starting from the beginning of school attendance and lasting approximately two years (usually from the age of six to the age of eight or nine), when the development of motor skills depends on physical growth, while both gross and fine motor skills significantly improve, movements are faster and more coordinated and the level of fitness skills – muscle strength and gradually also endurance – increase.

A large number of previous researches in monitoring the motor development of children of younger school age have been focused on individuals with a high level of motor performance (talent management focused at individuals talented in sports). The issue of children with a low motor performance has been processed only marginally, even though the renown professional public of this field strongly encourages regular diagnosis of the state of motor fitness especially in the children of younger school age (Moravec et al., 1996 and 2002; Thomas & Nelson, 2001;

Suchomel, 2003; Rubín et al., 2020, etc.). The point is that the low level of motor performance at this age foreshadows the potential danger of an unhealthy development of the individual and places such children into a significant risk group from the health perspective (Portmanová, 1995; Vrbas, 2010). Moreover, for a high percentage of children with low level motor performance, school physical education is not fun; frequently experienced failures have a significant influence on building relationship to physical activity in general (Bunc, 2000; Ignico & Mahon, 1995; Poole, 1996; Růžička, Agricola, & Růžičková, 2021, etc.).

Approximately at the age of eight, younger school-age children reach such a physical maturity that their motor manifestations are relatively stable. Current research shows that the structure of motor skills of eight-year-olds is already similar to adults; from the results of motor tests, it is possible to assess the level of motor skills as well as motor fitness, and also differences by sex; eventually, it is even possible to predict further motor development (Vobr, 2013). This specific issue of the relationship between somatic parameters and motor performance was in our country intensively addressed by Suchomel (2002, 2004). Somatically and motor-talented children usually look for physical activities themselves, while motorically non-talented children often have very low physical activity. This ultimately leads to further deterioration of their often disadvantageous somatic and functional characteristics.

Motor skill testing and diagnostics of various age groups in the area of motor fitness and performance have been addressed since the second half of the 20th century (e.g. Mechelen et al., 1986; McCloy & Young, 1954; Ranganathan, et al., 2004; Reiser, 2005; Salcman, 2015; Scott et al., 2017; Thomas & Nelson, 2001; Yue & Cole, 1992). So far, the most comprehensive studies of a long-term monitoring of the level of the physical fitness of children and youth are based on research carried out in 27 countries in all the continents from 1958 to 2003 (Tomkinson, Léger, Olds & Cazorla, 2003, Olds, Tomkinson, Le´Ger & Cazorla, 2006) and demonstrate an unfavourable state at the level of strength and speed abilities during the monitored period – a slight improvement between the end of the 1950s and approximately the year 1970 is followed by a permanent decrease in the level of the above mentioned motor prerequisites during all the ensuing decades. In particular, however, one can observe a continuous and alarming regression of the state of endurance abilities manifesting themselves significantly since the mid-70s of the 20th century (Tomkinson, 2007). In the Czech and Slovak language area, the issue was studied by Štumbauer (1990), Kovář and Měkota (1995), Moravec, R., Sedláček, J., & Kampmiller, T. (1996), Gajda and Měkota (2000), Chytráčková (2002), Zapletalová, Ľ. (2002), Neuman (2003), Měkota and Cuberek (2007), Psotta (2012), Čillík, I., Kremnický, J., & Kollár, R. (2016), etc. The current broader view of the possibilities of motor testing was addressed by Rubín, Suchomel & Kupr (2014), who compared test systems which can be currently used in the Czech Republic to assess physical fitness in school-age pupils: Eurofit, Fitnessgram, Indares, OVOV and Unifittest. Their paper helps to clarify in a unique way the meaning and development of the concept of motor fitness and health-oriented fitness; and it can help especially physical education teachers with the practical decisions which test system or specific tests from the given test batteries they should select for testing under specific school conditions.

Monitoring and evaluating the state of selected motor skills and fitness levels can provide a significant functional basis for the effective work – most importantly – of physical education

teachers, whose goal is to create a basis for healthy motor development, positive attitude towards physical activities and required level of physical literacy – i.e. understanding the importance of physical activities for health and overall quality of life.

METHODS

The aim of the research was: with the help of 4 motor tests (standing long jump; sit-up test; 4x10 m shuttle run; Leger test /Beep test/) *(1)* to assess the level of motor fitness in comparison with the values of UNIFITTEST (Kovář & Měkota, 1995); *(2)* to assess the significance of difference in performance between the sexes; and *(3)* to assess the current status of the mean values of body height and body weight with the values of the National Institute of Public Health's National Anthropological Research (NIPH's NAR 2001). (CZ: Státní zdravotní ústav, SZÚ – Celostátní antropologický výzkum, CAV).

Based on the set goals, three research questions (RQ) were formulated:
RQ1: *What is the level of physical fitness of the tested pupils compared to the UNIFITTEST standards?*
RQ2: *What is the difference in the results of individual motor tests between the sexes?*
RQ3: *What is the level of the values of body height and body weight of the tested pupils compared to the values of NIPH's NAR 2001?*

The research methodology was based on empirical scientific approach with the use of quantitative approach based on the deductive process of implemented testing and measuring. The main aim was to obtain objective data and results based on them, subsequent interpretations and answers to the formulated research questions with final conclusions.

To obtain the necessary statistical data and evaluate the current status of motor fitness in the pupils of selected primary schools in Hradec Králové Region and Pardubice Region, the method for measurement and testing was used to determine motor and somatic parameters as well as statistical and factual analysis of data and comparison of the obtained results. The originally planned expected number of surveyed respondents was 500 pupils of the 2nd grade of primary school. To obtain complete data from one school class, 2 to 3 PE teaching units were necessary. Due to the epidemiological situation linked with the SARS-CoV-2 / Covid 19 and the implemented pandemic restrictions during the school year 2020–2021, only a part of the planned scope was realized. Some incomplete sets of measurement results which did not allow for a meaningful statistical evaluation of the results had to be excluded from the evaluation. The results of the survey, which was carried out as pilot research with a planned continuation in the form of complete testing of the given regions (with possible future coverage of the whole territory of the Czech Republic), may provide not only the necessary verification of methodology and organizational approach, but also an initial current picture of the level of health-oriented physical fitness of primary school children in the selected regions of the Czech Republic. The conclusions can be also helpful for determining a recommended exercise regime of school children depending on the degree of ontogenetic development of the individual.

The research group consisted of boys (n = 129; average body weight 29.18 kg; average body height 127.01 cm; average BMI 18.09) and girls (n = 99; average body weight 27.69 kg; average body height 125.53 cm; average BMI 17.49) attending the 2nd grade of primary school (PS). Pupils come from a total of 6 primary schools in Hradec Králové and Pardubice Regions. Testing took place in the week of 21st to 25th June 2021, always in the gym of the relevant PS.

The obtained results of arithmetic mean in individual motor tests in boys and girls were then compared with the Czech UNIFITTEST standards (Kovář & Měkota, 1995) for the general population of the given age category. Although Rubín et al. (2014) in their comparative study consider FITNESSGRAM to be the most advantageous battery, which best reflects modern approaches to the assessment of physical fitness, its usability is limited mainly by the absence of normative standards related to our population (the standards were designed for the needs of the US population). Moreover, use in PE teaching units is also limited by the high cost of acquiring a test set containing special equipment. Even though UNIFITTEST – as a specifically Czech test battery with its current software version for processing the resulting values and supplementing the test system with the evaluation of results in relation to the growth age in children and youth categories (Chytráčková, 2002) – does not provide the possibilities of comparison with other countries, it does offer an objective evaluation of the results within the framework of domestic monitoring thanks to the existence of national standards (Rubín et al., 2014).

For the results of current level of motor fitness based on the results of individual motor tests, the difference between sexes and the calculation of substantive significance (effect size = ES) were evaluated. According to several authors (Blahuš, 2000; Ellis, 2010; Soukup, 2013), the correct interpretation of the results of the intentional set should be made with the help of the coefficients of substantive significance; statistical significance should be only a tool to confirm substantive significance. To determine whether the distribution of the obtained data can be considered normal, we used the Shapiro-Wilk test of normality. For the sets where the normality test showed a normal distribution, we used the T–test. In contrast, for the sets where the normality test did not show a normal distribution, we used Mann-Whitney U–test for further data analysis. Significance level was set at $\alpha = 0.05$. We used Cohen's d as substantive significance coefficient. According to Cohen (1988), we can interpret the value of effect size as small ($d < 0.20$), medium ($d = 0.50$) or large ($d > 0.80$). Data analysis was performed in the Statistica software (Tibco Software, Inc.). The found current state of the mean values of body height and body weight in pupils of selected primary schools was compared with the mean values of body height and weight of the NIPH's NAR 2001 national research. We used the Microsoft Excel software (Microsoft Corporation) to calculate arithmetic means and we subsequently compared the results with values based on the percentile graphs of NIPH's NAR used in the Czech Republic in common paediatric practice.

Our research sample included probands aged 7.1 to 7.9 years; therefore, we used standards for 8-year-old pupils. Probands outside the stated age limit were excluded from the set before processing data. The calculation of arithmetic means was performed again in the Microsoft Excel software (Microsoft Corporation). Evaluation of somatic parameters (body height and body weight) was performed – to record all the data during data collection in motor skills testing – according to the percentile growth charts commonly used in paediatric practice in the Czech Republic (NIPH's NAR).

Theoretical background, together with the experience gained by testing motor performance and fitness as well as using professional resources, has brought to existence a set of tests, which contains four items. The basic principle was the choice and creation of a procedure enabling a simple and practical execution of appropriate measurements with the emphasis on maximum efforts to standardize the conditions for a future large-scale testing as well as for increasing the accuracy of the results obtained. An overview of the tests together with their brief characteristics is given in Table 1.

Table 1. Description of the used tests

Test	Description	Evaluation of results
Standing long jump	By jump and two-foot take-off from the spot to reach the longest distance possible	Distance in cm (accurate to 1 cm) 2 attempts, both are recorded, only the best attempt is evaluated
Sit-up test	Perform the maximum number of repetitions of position changes from lying to sitting and back (with legs held)	Number of repetitions in 1 min
4 × 10 m		
shuttle run	Overcome the distance of 10 m four times in the prescribed way in the shortest possible time	Time in s (to 1 decimal place)
Leger test (Beep test)	Continuous running at a given pace on a defined track	
for as long as possible	The number of shuttles determines time in test	

For the needs of the realization of measurements at schools, informed consent was obtained from the legal representatives of all tested pupils as well as approval of the field testing of children by the UHK ethics committee.

RESULTS

Table 2 shows the arithmetic mean (M) values for individual tests in boys. As mentioned above, these values are compared with the UNIFITTEST values (Kovář & Měkota, 1995) for the Czech general population of this age category.

Table 2. Comparison of measured mean values with UNIFITTEST standards for boys

Motor test	Mean values	UNIFITTEST	Evaluation
Standing long jump (cm)	123 cm	113–130 cm	Below average
Sit-up test (number of repetitions)	28	22–31	Average
4 × 10 m shuttle run (time in sec.)	14:23	13:90–14:40	Below average
Leger test (time in min.)	3:08	2:76–4:00	Below average

We did the same with the girls. In Table 2 below we can see the results of comparison with the UNIFITTEST standards for girls of the same age from the Czech general population.

Table 3. Comparison of measured mean values with UNIFITTEST standards for girls

Motor test	Mean values	UNIFITTEST	Evaluation
Standing long jump (cm)	120 cm	107–124	Below average
Sit-up test (number of repetitions)	27	22–30	Average
4 × 10 m shuttle run (time in sec.)	14:46	14:30–14:80	Below average
Leger test (time in min.)	2:07	2:00 – 2:50	Significantly below average

Tab. 4 shows the results of comparison of individual motor tests between sexes. T-test was used for the comparison of standing long jump test and sit-up test; for the remaining two motor tests, i.e. 4 × 10m test and Leger test, we used Mann-Whitney U–test. We expressed the level of substantive significance with the use of effect size (ES), which allows us to decide if the result has practical consequences. A statistically significant difference was found in the motor test of 4 × 10 m shuttle run and in the Leger test. The results in the standing long jump test and sit-up test show that there is no significant difference in performance between boys and girls; the difference in performance is rather small in the 4 × 10 m shuttle run and Leger test.

Table 4. Results of comparison for individual motor tests and effect size values

Motor test	P	ES
Standing long jump	0.320	0.135
Sit-up test	0.513	0.094
4 × 10 m shuttle run	0.018	0.321
Leger test	0.041	0.386

Notes: *p = level of statistical significance; ES = effect size*

Figure 1 shows the NIPH's NAR percentile graphs for body height and body weight for boys (0–18 years). As the solid lines show, the mean body height in the general population for the 8-year-old category is 131.5 cm. The average height of boys tested by us was 127 cm (dashed line), which means a lower value than the population average. The average weight of 8-year-old boys in the population is – again according to the NIPH's NAR – 27 kg. Our results show a value of 29 kg, which is above the population average.

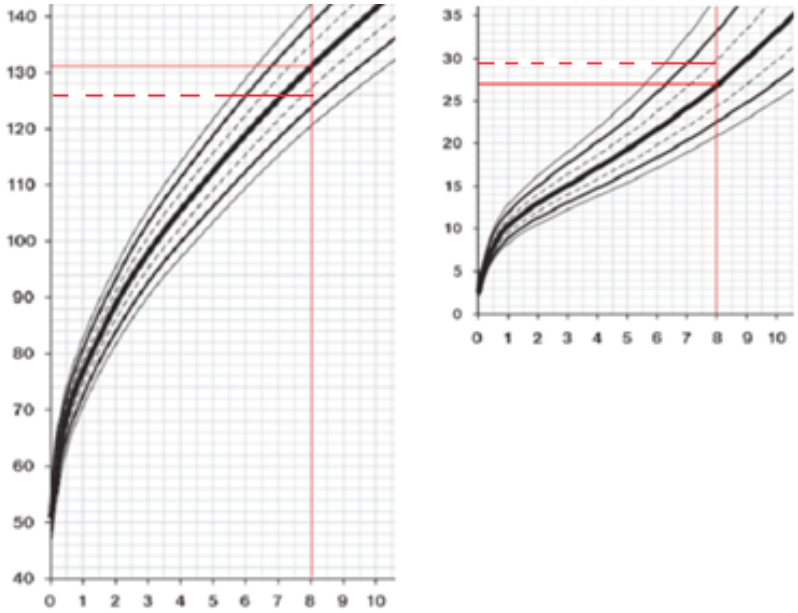

Figure 1. Percentile graph for body height (left) and body weight in boys (NIPH's NAR 2001)

Figure 2 shows the NIPH's NAR percentile graphs for body height and body weight for girls (0–18 years). The solid lines again show that the average body height in the general population for the 8-year-old category is 130 cm. The average height of girls tested by us was 125.5 cm, which means a lower value than the population average. The average weight of 8-year-old girls in the population is – according to the NIPH's NAR – 27 kg, the same as for boys. Our results show a value of 27.7 kg, which is above the population average.

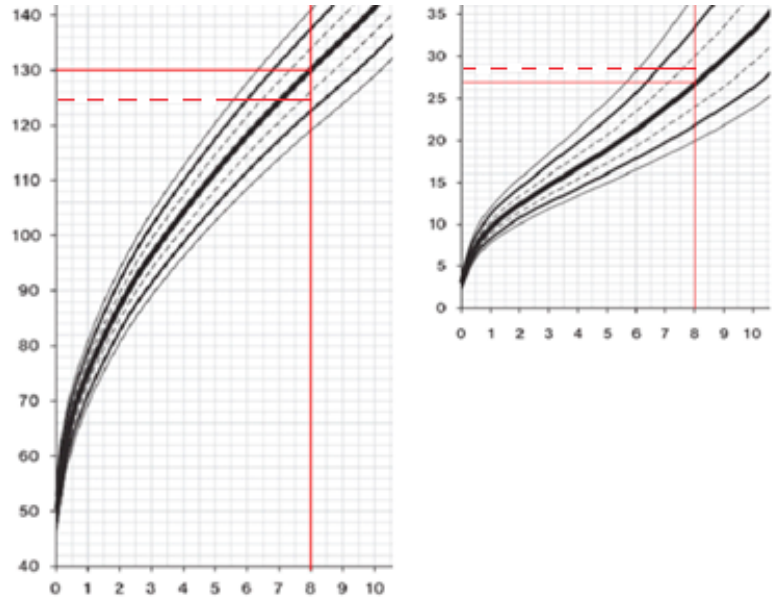

Figure 2. Percentile graph for body height (left) and body weight in girls (NIPH's NAR 2001)

DISCUSSION

At the present time, there are conflicting views in the professional circles about the state and level of motor skills of today's school generation. Testing the motor preconditions of children and comparing their current performances in selected standardized test items with valid standards can help with mapping the actual state of the current generation of primary school children as a tool for finding measures and ways for their healthy and effective motor development. It provides physical education teachers in schools with a methodological apparatus for regular diagnostics as well as data on the basis of which they can model the content of their teaching in such a way as to bring the necessary comprehensive effect. The evaluation of the state of given motor preconditions of children before the age of 9 is also important from the point of view of the selection of talented children to be included in athletic training within high performance sports (Perič, 2012; Vobr, 2013; Holm et al., 2013; Kita et al., 2016; Paška et al., 2018).

The aim of our research was to evaluate the level of motor fitness in comparison with the UNIFITTEST values (Kovář & Měkota, 1995), then evaluate the significance of difference in performance between the sexes and evaluate the current state of the mean values of body height and body weight with the values of the National Institute of Public Health's National Anthropological Research of 2001 (NIPH's NAR 2001). Based on the set goals, the research questions were formulated thus:

RQ1: *What is the level of physical fitness of the tested pupils compared to the UNIFITTEST standards?*

In standing *long jump* test, *below-average* values were achieved in comparison with the UNIFITTEST standards (Kovář & Měkota, 1995) for the Czech general population of the given age category, both in the monitored group of boys (Table 2) and in the group of girls (Table 3). Although similar testing results can be found in similar observations of 8-year-old pupils (Čillík et al., 2012 – 121 cm, Paška et al., 2018 – 120 cm), the arithmetic mean found by us, i.e. 121.5 cm, is significantly below the limit of Moravec et al, 2002 (133 cm); this is true even in comparison with the results of monitoring 7-year-old pupils (Zapletalová, 2002 – 130 cm; Sedláček and Cihová, 2009 – 125 cm). It can be stated that the current trend of motor readiness in the area of muscle strength of the lower limbs of 2nd grade pupils of primary school has been on the decline, resp. stagnation, during the last 20 years.

In *4× 10 m shuttle run* test, we must again state, in comparison with the UNIFITTEST standards (1995), *below-average* evaluation both in boys and girls. Compared to similar researches, the arithmetic mean of by us monitored performance of both boys and girls, which is 14.35 s., represents a better achieved value than research by Čillík et al., 2012 (14.64 s.) or Paška et al., 2018 (15.67 s.). Only Sedláček & Cihová, 2009 recorded a better time (13.60 s.) even among 7-year-old pupils.

Comparing the performances in *Leger test* with the UNIFITTEST standards (1995), we must state again that *below-average* evaluation was achieved in boys, and even *significantly below-average* evaluation in girls.

Sit-up test is the only by us observed test item in which at least *average* evaluation was achieved, in comparison with the UNIFITTEST standards, in both monitored groups (boys and girls).

RQ2: *What is the difference in the results of individual motor tests between the sexes?*

The presented results of the comparison for individual motor tests and the values of effect size (Table 4) show a statistically significant difference in the *4 × 10 m shuttle run* motor test and *Leger test*; no statistically significant difference between the sexes was confirmed in the remaining tests. The effect size values show only a small effect in the *standing long jump* and *sit-up* motor tests; the values are in the range of small and medium effect in *4 × 10 m shuttle run* and *Leger*. From this point of view, we can therefore state that there is no difference in performance between boys and girls in the *standing long jump* and *sit-up* motor tests; the difference in performance is rather small in the *4 × 10 m shuttle run* and *Leger test.*

RQ3: *What is the level of the values of body height and body weight of the tested pupils compared to the values of NIPH's NAR 2001?*

The results of testing showed an average value of body height (BH) in the boys we tested – 127 cm, which means a *lower* value compared to the population average (131.5 cm). And while the average value of BH in the general population of girls is 130 cm, it was 125.5cm for the girls we measured, which also means a *lower* value than the population average. The result of 29 kg in the parameter of body weight (BW) for by us monitored boys in comparison with the value of 27 kg for the Czech general population of 8-year-old boys according to NIPH's NAR 2001 means *above-average* values in relation to the general population. The average mean of BW for 8-year-old girls in the population is 27 kg, which is, according to NIPH's NAR 2001, the same as for boys; the result of our monitoring with the value of 27.7 kg shows an *above-average* result for girls (similarly as for boys) in relation to the general population.

The connection between the results of the level of physical fitness and the measured selected somatic parameters of the pupils tested by us indicate – similarly to the conclusions of Tomkinson's study (2007) in the field of longitudinal trends between 1958 and 2003 – a possible connection between the decrease in the level of motor skills and the simultaneous increase in the body weight of individuals.

In the area of monitoring body composition – body mass index (BMI arithmetic mean), a comparison can be made with the international data of similar age category due to the evaluation of children and youth groups of all continents carried out in 2003–2013 (Suchomel & Rubín, 2017). In this context, our group from Hradec Králové and Pardubice Regions with the resulting values of 18.0 $kg \cdot m^{-2}$ (boys) and 17.5 $kg \cdot m^{-2}$ (girls) ranks approximately as an average position between the results of the Canadian group (Tremblay et al., 2005) with relatively high values of 19.8 $kg \cdot m^{-2}$ (in both boys and girls) and research group from Belgium (Cardon et al., 2007) with lower values of 17.1 $kg \cdot m^{-2}$ (boys) and 17.6 $kg \cdot m^{-2}$ (girls), while the lowest values of 14.6 $kg \cdot m^{-2}$ (boys) and 15.0 $kg \cdot m^{-2}$ (girls) were found in African children from the Republic of South Africa (Monyeki et.al, 2006). The results of our investigation showed basically identical BMI values with the results of the Liberec regional research of 10–12-year-olds with values of 18,2 $kg \cdot m^{-2}$ for boys and 17,3 $kg \cdot m^{-2}$ for girls (Rubín et al., 2014), which would indicate rather a negative trend Currently, according to Kalman (2022), more than a fifth of the population of Czech children aged 11–15 have problems with their weight (15% of adolescents are overweight and 6% are obese), while the worst values

are reported in the Hradec Králové Region. Considering the target group of 8-year-old boys and girls monitored by us, a study of ongoing changes in the exercise and dietetic regime of children aged 8–11 as well as on the reasons for the increase in BMI during this period would be a very valuable material in this context. The most likely reason is the beginning of school attendance and its subsequent impact causing a significant change in the children's lifestyle.

In the area of comparing the current state of average means of BH and BW with the values of the National Institute of Public Health's National Anthropological Research of 2001 (Figure 1 and 2), it can be stated then that while the BH of both boys and girls monitored by us records a slightly lower value compared to the Czech Republic standard, on the other hand, BW shows a higher value. It can be assumed that one of the main reasons is insufficient physical activity and wrong exercise regime of children and subsequent effect on BW due to hypokinesis; ultimately, it has the potential to cause imminent deterioration of health and future quality of life of the young generation. Regular monitoring of the given parameters of physical development of school-age children thus also provides an early detection of possible disorders and can prevent more serious complications at a later age (NIPH's NAR 2001).

The main purpose of testing pupil's physical preconditions is to provide a picture of the state of physical readiness of today's school children as a starting point for purposeful motor development within school physical education; but, last but not least, to encourage also physical activity in families. In addition, monitoring the development trend in the given parameters and its evaluation underlines the correctness of the perceived need of extensive testing of primary school pupils in the Czech Republic with a planned start in autumn 2022 which would provide a comprehensive picture of the level of necessary change in the area of physical literacy of children as well as in work of teachers of school physical education; eventually it would enable better talent selection and could provide a motivation element for an active family life aiming to a higher quality of life (for instance Bunc, 2000; Vrbas, 2010; Psotta et al., 2012; Rubín et al., 2020).

CONCLUSION

The aim of the research was to evaluate, with the use of selected standardized motor tests, the level of motor fitness in comparison with the values of UNIFITTEST, to assess the significance of difference in performance between the sexes and to compare the current state of the mean values of body height and body weight with the values of the National Institute of Public Health based on its 6th National Anthropological Research according to the percentile growth graphs commonly used in paediatric practice in the Czech Republic. Testing took place in pupils of 2nd grade of primary school (boys: n=129; girls n=99) in Hradec Králové and Pardubice Regions. Comparison with the UNIFITTEST values in boys showed average performance in the sit-up test and below-average performance in the standing long jump, 4x10 m shuttle run and Leger test. For girls, the comparison showed average performances in the sit-up test, below-average performances in the standing long jump and 4 × 10 m shuttle run tests and significantly below-average performances in the Leger test. The results of statistical analysis made with the Mann-Whitney U test, T-test and effect size showed a significant difference between the sexes in the 4 × 10 m shuttle run test ($p = 0.018$) and in Leger test ($p = 0.041$);

the magnitude of substantive significance (Cohen's d) was in the range of small and medium effect (d = 0.321, resp. d = 0.386). Comparison of the mean values of selected somatic parameters (BH and BW) in tested pupils with the NIPH's NAR (2001) values showed a lower BH and a higher BW compared to the NIPH's NAR percentile graph values: boys 131.5 cm (NIPH's NAR) x 127 cm; 27 kg (NIPH's NAR) × 29.2 kg; girls 130 cm (NIPH's NAR) × 125.5 cm; 27 kg (NIPH's NAR) × 27.7 kg.

The results of the monitoring of our tested sample (n = 228) provide only a partial picture of the state of child population of the given parameters in the Czech Republic and it is not possible to draw very significant conclusions from it. We are, however, convinced that comparison with the valid UNIFITTEST standards and percentile NIPH's NAR graphs allows to express at least partially the current state, but also to voice the necessary appeal regarding the current need for overall testing and subsequent work with the obtained conclusions towards the support of better development of motor skills of school children not only in the process of teaching physical education. We can also find its significance in the field of verification of the used testing methodology created in 2018–2020 within the working group of experts in sport science representing physical education university departments in the Czech Republic in cooperation with the University Sports Centre of the Ministry of Education, Youth and Sports; methodology having its application in monitoring children within the school environment in the Czech Republic.

Due to the Czech government's measures linked with the SARS-CoV-2/Covid-19 pandemic, which caused major limitations in the area of field research at the time of the planned data collection and thus influenced also the possibility of data processing and presentation of results, we perceive these outputs as pilot ones. The given methodology is currently used for comprehensive monitoring of the level of motor fitness and relating somatometric parameters at Czech primary and secondary schools; this monitoring is to be launched in this year 2022 by the Czech School Inspectorate (Česká školní inspekce) in organizational cooperation with the Czech School Sports Clubs Association (Asociace školních sportovních klubů).

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