Croatian Journal of Education
Vol.18; Sp.Ed.No.1/2016, pages: 87-101
Original research paper
Paper submitted: 19th February 2015
Paper accepted: 6th April 2016
doi: 10.15516/cje.v18i0.2162

Motor Abilities and School Readiness of Disadvantaged Children

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Abstract

From the day a person is born motor development is very important. There are different phases of motor development, and if some of the phases are omitted, the child will probably have difficulties in physical, social and psychological development. Physical activity is positively related to academic achievement (Coe, Pivarnik, Womack, Reeves, & Malina, 2006), cognitive functioning (Ellemberg, 2010) and physical and general self-validation (Crocker, Kowalski, & Hadd, 2008). Unfortunately, not every child has an opportunity for healthy motor development. Furthermore, the majority of disadvantaged children start school with social, cultural and educational disadvantages. The purpose of this study was to examine the differences between typically developed children and disadvantaged children in the first grade of primary school in the areas of school readiness and motor abilities. A battery of 7 school-readiness tests (DIFER) and 7 motor tests was administered to a sample of 19 disadvantaged children (M=7.56, SD=0.87) and 25 typically developed children (M=7.53, SD=0.35). Significant differences (F=5.43; p≤0.05) between the groups were observed in both areas. The disadvantaged children were falling considerably behind their peers. In those preschool and primary school institutions where the disadvantaged children from lower social status are enrolled in large numbers, a straightforward form of motor skills development ought to be implemented. A developmental programme would provide further help for preparing disadvantaged children for academic learning.

Key words: *academic achievement; first-graders; motor development.*

Introduction

The majority of disadvantaged children start school with social, cultural and educational disadvantages. They come from broken homes, surrounded by

unemployed adults, submerged in unsolvable daily conflicts, unable to break out. The social and cultural components which also influence one's social relationships, hinder them in fulfilling their basic needs. They have fundamental values which often lead them to act against their own interests. Their immediate environment regressively influences their tentative attempts to break out. A disadvantaged situation is likely to perpetuate itself, only enhancing these people's marginal position in society. These problems are especially present in urban areas in the regions hit by economic crisis, particularly affecting young people with ambitions to learn and study.

Those who complete their elementary studies do so with great difficulty, by repeating classes, finishing school later, and with their school years full of conflicts. Some of those who have actually managed to finish the eighth grade do not even try to continue their studies, drawing on their previous experience. Those who try their luck at secondary school will likely be hampered by poor performance, experiences of failure, and influences of their own environment drawing them back, so they eventually drop out. The pupils are drawn back by their families and they also vividly remember the differentiation experienced in primary school, all of which leads to their failure to meet the increasing expectations set by secondary schools. Thus the young people with mediocre learning skills, but with greatly developed fine motor skills will stay at home, slipping further down the slope. Children with higher levels of school readiness at age five are generally more successful in school, are less likely to drop out of secondary school, and are likely to earn more as adults, even after overcoming the differences in family background (Duncan et al., 2010). In fact, it is quite possible that they might be able to achieve some results, provided that they have inclusive and expert help, which would take their needs and interests into consideration, especially given that low-level education is likely to lead to future low-level education, resulting in multiple disadvantaged conditions.

At the simplest level, there are two basic theories as to why disadvantaged (poor) children have poorer school results than other children. The proponents of one view focus on the economic differences between poor families and other families, and argue that many of the negative outcomes observed in poor children and their families are a by-product of a lack of financial resources. Another explanation is that it is not money itself, but numerous parental characteristics, that are associated with poverty, that are harmful to children (Mayer, 1997). The parents' educational qualifications and the child's attitude towards school and Physical Education exhibit underlying connections. Disadvantaged children do worse at school not only because their families have fewer financial resources but also because their parents tend to have less education, poorer health and other characteristics that place their children at risk of achieving less successful results (Janus & Duku, 2007; Lee & Burkam, 2002). Children's early academic skills are higher, on average, when parents have more years of schooling, and this association persists even after viewing the parents' inherent abilities, according to evidence from welfare reform evaluations and sophisticated statistical analyses (Gennetian et al., 2008).

Cognitive skills of disadvantaged children lag significantly behind in early childhood when compared to those of their peers and it is possible to reduce this difference only through high-quality, long-term, competent, early-childhood compensation programmes. Without these counterbalancing factors the disadvantaged children will face further disadvantages of such proportions that the 12 years spent in general education will not be sufficient to overcome them (Brooks-Gunn, 2003; Grunewald & Rolnick, 2003; Heckman, 2006). These children will be those who, having completed primary school with poor grades and very poor performance, will not continue their secondary school education in any form. Or, if they do, they will probably drop out soon. They are the future unemployed.

It is of vital importance for the success of early schooling to know what stage the child is at, in terms of skills acquisition. These are the skills which education later builds on. Where does the child stand in terms of the development of native language? Does the child have any notion of numbers? Are the neural and fine motor skills, needed for learning to write, properly developed?

Previous research confirmed that skills development is a continuous, long-term process. When starting school, children may exhibit a several years' difference in development (Nagy et al., 2004). When enrolling in school, some of the pupils' skills development level is that of average children aged 4 or 5. This disadvantage gap cannot be bridged by the school itself in the first few years of schooling. Starting school successfully will determine the children's long-term future. The gulf between children will only expand over the years at school. If the first school experiences are those of failure, then the learning motivation may suffer. If this should happen, the child will have no stimulation to invest time and energy into school and learning, which negatively influences the very basics of the child's development (Józsa, 2007). According to Piaget's theory of cognitive development, motor and cognitive development are strongly related and driven by heredity: in his view, a child's unfolding motor skills give rise to increasing possibilities to explore and understand the environment, leading to more and more differentiated cognitive structures (Piaget & Inhelder, 1966). This accounts for the fact that motor and cognitive systems develop dynamically by interacting with each other (Smith et al., 1999). The movement content of Physical Education has a personality development effect, since the person can only be understood in their psychosomatic entity, but can only be taken as a functional part of the education process if the cognitive and affective sphere, primarily character, is also developing, creating valuable habits (Rókusfalvi, 1980). Intellectual and perceptual-motor skills are acquired in fundamentally similar ways (Rosenbaum et al., 2001). Physical Education is able to develop moral and voluntary characteristics in children, practical skills, and prepare them for a healthy lifestyle, as well as to teach them to stand their ground in the work environment. Through movement they gain experience and recover the physical, mental and emotional energy (Rókusfalvi, 1980). The effects of physical activity on cognitive functions are likely to differ by the type

of physical activity (Diamond & Lee, 2011). Research carried out by Kubesch et al. (2009) directly compared 5 minutes of a teacher-led classroom exercise break to 30 minutes of Physical Education and found that only the 30-minute activity resulted in improvements in cognitive functions. The majority of disadvantaged children accept their fate and are not motivated to be involved in school activities. Given the lack of parental support, these children are left on their own in this situation, and the teachers are faced with an enormously difficult task.

The aim of the study is to examine the relationships between motor abilities and school readiness of primary school pupils in Horgoš, because that kind of assessment was not typical for this geographic region. With this research we can contribute to better recognition of disadvantaged children and we can help them bridge the gap.

Methods

Subjects and Sample Characteristics

The research method had a transversal design. All measurements and tests were conducted on a sample of 44 respondents from Horgoš (Serbia), first-graders attending *10. Oktobar Primary School*. 25 respondents were typically developed children and 19 were disadvantaged children (Mean=7.39; SD=0.44). Typically developed children were randomly selected and all disadvantaged first-graders attending the school were included in the study. They attended classes taught by different teachers for each class during the school year 2013/2014, following the prescribed syllabus for each class. Social and economic status was estimated by the school pedagogue and psychologist, based on family income (social welfare beneficiaries). Before testing, written consent had been obtained from the parents.

Instruments

As a sample of measuring instruments for the purposes of study, the following anthropometric characteristics were selected:

1) Body height (cm) – measured using anthropometry according to Martin (GPM Anthropometer 100; DKSH Switzerland Ltd., Zurich, Switzerland).
2) Body weight (0.1 kg) – measured using InBody 230 (Biospace Co., Ltd, Seoul, Korea).

For assessing the motor abilities of young schoolchildren, standard motor tests were used (according to the model of Bala, M.V. Stojanović, & M. Stojanović, 2007), and the following battery of tests was applied:

1) *to assess the factors of movement structuring*:
   – reorganization of stereotypes of motion: 1) obstacle course backwards (0.1 s);
   – whole-body coordination: 2) standing broad jump (cm), 3) running speed, 20-meter dash from a standing start (0.1 s);
2) *to assess the functional synergy of factors and regulation of tone*:
   – frequency rate: 4) hand tapping (freq.);
   – flexibility: 5) seated straddle stretch (cm);

3) to assess the factor of duration of the motor units excitation:

– repetitive strength of the trunk: 6) sit-ups in 60 s (freq.),
– static strength of the arms and shoulders: 7) bent arm hang (hanging pull-ups) (0.1 s).

The mapping of the acquisition process of the basic skills described above is the aim of DIFER (Diagnostic System for Assessing Development). This package is used to diagnose the development of basic skills and to specify the criteria for further amelioration of 4-8 years old children's skills development (Nagy et al., 2004):

– writing movement coordination skill (the condition for mastering the writing skill);
– speech and hearing skill (the condition for mastering the reading skill);
– relational vocabulary (the basic condition for effective verbal communication);
– basic calculation;
– experience-based deduction;
– experience-based comprehension of relationships (the conditions of mental development);
–socializing, i.e. some social skills (the conditions for school life and personality development).

This programme package is criterion-oriented. The criterion for a given skill is set, and if the criterion acquisition for a given skill can be determined, the skill is developed and it is functioning optimally. Also, it is diagnostic, since we receive information about all components of the acquisition level. The skills development diagnostic map shows us which components of a skill the child has already acquired, and which need further development. The successful completion of a test indicates that the skills have been optimally acquired and practiced, which is presented as an almost 100% result. In other words, the child's development level is indicated based on the optimum development criterion of a given skill.

The aim of DIFER is to facilitate the successful entry to school. If it is applied, we gain information on where the child stands in the development process and what steps have to be taken in terms of a more successful start of school, which are of key importance on a path to better academic success. It can positively be stated that the degree to which the basic skills are acquired largely depends on the level of development of these so-called critical basic skills.

The basic skills are assessed annually, which enables educators to focus on progress based on the collected data, so they can determine when the child has completed the acquisition of a given skill, and where the child stands with their learning development in relation to the pre-determined criterion. If a skill does not function at the optimum level, it must be developed further until the optimum skill level is achieved. Being aware of the criterion, each skill has five developmental levels defined: preparatory (a child in need of a lot of individual development), beginner, advanced, completed, and optimum level (optimum applicability level). Thus the level of development of these basic skills can be determined for each child.

Measurement Procedure

Testing and measuring were performed during March 2014. The testing was performed by masters degree students from Teachers' Training Faculty in Subotica, where the teaching language is Hungarian. Body height and body weight were measured first, and motor abilities were tested subsequently.

Motor abilities were tested in this order: running speed 20m, obstacle course backwards, standing broad jump, hand tapping, bent arm hang, seated straddle stretch, sit-ups in 60s.

DIFER test was performed after two days of motor abilities testing. DIFER tests were administered individually and took between 40 and 45 minutes for each child.

Data Analysis

Data were analysed using the IBM SPSS 20.0 statistical software. The differences in descriptive characteristics were calculated with ANOVA. Descriptive statistical methods were used for the calculations of the means and standard deviations. MANOVA tests were used to determine the differences between social groups. If multivariate effects were significant, univariate analyses (ANOVA) were carried out for each dependent variable. With t-test, differences between the disadvantaged and typically developed children were analysed for both genders separately. Two-way ANOVA was used to analyse the effect of gender and categories of students regarding school readiness.

Results

Forty-four children were included in the testing. Body characteristics of the sample are presented in Table 1.

Table 1

Descriptive characteristics of the main sample

	Disadvantaged (n=19)	Typically developed (n=25)	f
Variable	Mean±SD	Mean±SD	
Body Height (cm)	116.92±4.31	124.18±5.37	15.28**
Body weight (0.1kg)	21.47±2.47	24.33±3.91	5.01*
Body mass index (kg/m^2)	15.76±1.17	15.81±1.35	0.00

Legend: SD-standard deviation; f-univariate analysis of variance (ANOVA); *p≤0.05*; ** p≤0.01.*

This study confirmed that children from disadvantaged families significantly lagged behind the children from typical families in terms of average height and rate of growth, but there were no statistically significant differences in BMI.

Table 2

Differences in motor abilities and school readiness between the Disadvantaged and Typically developed children

	Disadvantaged (n=19)	Typically developed (n=25)	f
Variable	Mean±SD	Mean±SD	
20-m dash with a standing start (0.1 s)	57.75±16.86	46.72±5.06	6.87**
Obstacle course backwards (0.1 s)	348.75±135.93	241.11±70.31	8.13**
Hand tapping (freq.)	14.33±3.72	19.72±2.67	21.34**
Seated straddle stretch (cm)	31.83±6.32	39.17±5.11	12.26**
Standing broad jump (cm)	106.50±35.88	130.94±24.62	4.92*
Bent-arm hang (0.1 s)	110.33±103.80	122.72±114.61	0.24
Sit-ups in 60s (freq.)	18.58±10.74	25.94±6.38	5.56*
Writing (point)	12.50±7.75	23.17±1.33	33.17**
Speech comprehension (point)	37.42±11.54	55.39±4.07	37.22**
Relational vocabulary (point)	14.17±4.46	21.06±2.66	28.08**
Calculation (point)	3.00±3.13	8.44±1.94	34.65**
Experience-based deduction (point)	2.92±2.39	6.33±2.59	13.30**
Relation-comprehension (point)	9.17±2.58	12.44±2.38	12.73**
Socializing (point)	31.08±7.37	40.44±5.37	16.21**
	F=5.43**		

*Legend: SD-standard deviation; f-univariate analysis of variance (ANOVA); F-multivariate analysis of variance (MANOVA); **.p≤0.05; ***.p≤0.01.

MANOVA results proved that in terms of motor abilities, school readiness level between disadvantaged and typically developed children exhibited statistically significant differences at the level p=0.002.

Table 3 clearly showed that there were significant differences between the disadvantaged and typically developed children in terms of factors of movement structuring (obstacle course backwards, standing broad jump, 20-meter dash with a standing start), functional synergy of factors and regulation of tone (hand tapping, seated straddle stretch), factor of duration of the motor units excitation (sit-ups in 60s). In the variable *bent arm hang* there were no significant differences between the two groups. The mean was lower than the average results in Vojvodina (Bala & Popović, 2007; Cvetković et al., 2007; Popović et al., 2006), which means that children in Horgoš have poor arm strength. In each case where a significant difference was found, it was the disadvantaged group who had lower results. This is of special significance. However, given the increasing passivity among them, they will try to avoid all forms of sports activities and the related social events. In terms of bridging the gap between the learning skills differences of the two groups, it was determined that in terms of coordination skills the disadvantaged group also showed lower level of development.

The fact that girls (Table 4) achieved systematically higher results than boys (Table 3) on school readiness tests is pedagogically interesting and has been shown in many other studies (Huttenlocher et al., 1991; Gurian & Stevens, 2004; Csapó

Table 3

Differences in motor abilities and school readiness between Disadvantaged and Typically developed boys

Variable	Boys (N=23)	DB (n=9)	TDB (n=14)	t
Body height (cm)	122.65±6.75	118.28±5.85	126.15±4.94	-3.09*
Body weight (0.1kg)	24.55±3.69	22.82±3.17	25.93±3.62	-1.91
Body mass index (kg/m^2)	16.35±1.14	16.36±0.95	16.34±1.33	0.04
20-m dash with a standing start (0.1 s)	53.47±14.86	62.71±19.74	47.00±4.47	2.46*
Obstacle course backwards (0.1 s)	286.72±112.85	350.75±126.31	235.51±70.91	2.44*
Hand tapping (freq.)	17.28±4.25	14.13±3.68	19.18±2.78	-3.73*
Seated straddle stretch (cm)	34.78±7.25	29.50±5.21	39.00±5.81	-3.61*
Standing broad jump (cm)	119.39±36.29	100.50±39.45	134.50±26.58	-2.18*
Bent-arm hang (0.1 s)	137.53±126.31	15.00±25.68	138.30±144.81	-2.21*
Sit-ups in 60s (freq.)	21.06±10.13	15.14±11.26	25.20±7.21	-2.25*
Writing (point)	17.00±7.79	9.88±6.32	22.20±1.57	-6.23*
Speech comprehension (point)	46.89±12.74	36.38±12.42	55.30±3.12	-4.67*
Relational vocabulary (point)	17.33±4.86	13.50±4.31	20.41±2.59	-4.21*
Calculation (point)	5.78±3.73	2.75±3.24	8.20±1.87	-4.48*
Experience-based deduction (point)	3.94±2.55	2.50±2.26	5.11±2.23	-2.44*
Relation-comprehension (point)	10.56±2.71	9.00±2.39	11.80±2.34	-2.49*
Socializing (point)	34.61±8.19	28.62±6.54	39.40±6.01	-3.63*

Legend: DB-Disadvantaged boys; TDB-Typically developed boys; t- Independent samples t-test; * $p \leq 0.05$

Table 4

Differences in motor abilities and school readiness between Disadvantaged and Typically developed girls

Variable	Girls (N=21)	DG (n=7)	TDG (n=14)	t
Body height (cm)	120.80±5.77	119±72	121.73±5.14	-0.65
Body weight (0.1kg)	22.85±5.65	23.43±7.71	22.33±3.48	0.36
Body mass index (kg/m^2)	15.60±2.36	16.14±3.31	15.12±1.11	0.82
20-m dash with a standing start (0.1 s)	48.08±7.59	50.80±9.73	46.38±6.02	1.02
Obstacle course backwards (0.1 s)	293.93±111.94	346.29±129.99	248.13±73.76	1.83
Hand tapping (freq.)	18.33±3.69	16.86±4.29	19.63±2.72	-1.51
Seated straddle stretch (cm)	36.93±5.75	34.14±6.06	39.38±4.47	-1.91
Standing broad jump (cm)	124.53±22.71	122.29±24.14	126.50±22.87	-0.34
Bent-arm hang (0.1 s)	127.40±113.40	155.00±183.78	103.25±64.44	0.74
Sit-ups in 60s (freq.)	24.40±7.08	21.57±8.01	26.88±5.51	-1.51*
Writing (point)	21.40±4.99	18.71±6.43	23.75±0.71	-2.19*
Speech comprehension (point)	50.67±9.65	45.14±10.88	55.50±5.26	-2.39*
Relational vocabulary (point)	19.67±4.65	17.14±5.30	21.88±2.69	-2.22*
Calculation (point)	6.93±3.19	4.86±3.02	8.75±2.12	-2.91*
Experience-based deduction (point)	6.27±2.86	4.43±2.44	7.88±2.23	-2.85*
Relation-comprehension (point)	11.93±2.81	10.43±2.69	13.25±2.31	-2.18*
Socializing (point)	39.27±6.01	41.75±4.49	41.75±4.49	-1.85

Legend: DG-Disadvantaged girls; TDG-Typically developed girls; t- Independent samples t-test; * $p \leq 0.05$

& Ivanović, 2010). The explanation for these differences could perhaps be found in behaviour. When girls show unacceptable emotional behaviour, the adults are more likely to intervene than when boys do so. Also, the lateralization of language to the left hemisphere occurs earlier among girls (Bornstein et al., 2004). Typically developed boys achieved statistically better results compared to disadvantaged boys in all variables of motor abilities and school readiness. Differences among girls were obvious but they were not all statistically significant. For variables of motor abilities typically developed girls achieved statistically significant results only in sit-ups 60s, and considering readiness for all variables, disadvantaged girls achieved lower statistical results, except for socializing. The sensitivity of the t-test difference between the independent groups was determined using GPower program software (Franz Powell, Universität Kiel, Germany). A larger sample is required for the significant relations in analysis (Table 4).

Table 5

Effects on school readiness

	F	Sig.
Gender	13.04	0.00
Category	101.24	0.00
Gender* Category	1.09	0.31

Two-way ANOVA of different groups studied the effect of gender and categories of students on school readiness. The interaction between the gender and categories of students was not statistically significant ($F = 1.09$, $p = 0.31$). A statistically significant influence of separate genders ($F = 13.04$, $p = 0.00$), as a separate impact category of students was fortified ($F = 101.24$, $p = 0.00$).

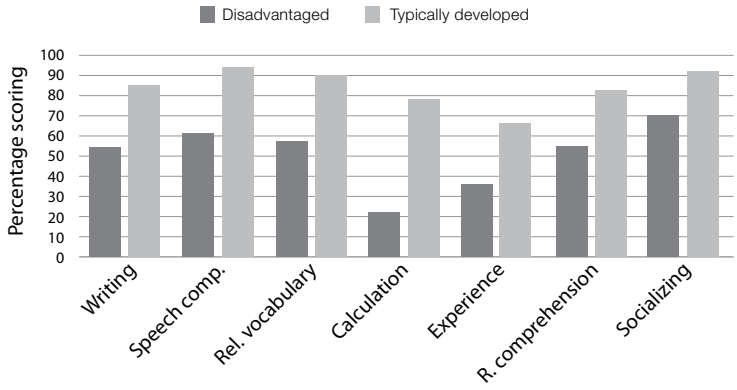

Figure 1. School readiness by social groups

As shown in Figure 1, the disadvantaged children are much more likely than other children to score very low on Calculation and Experience-based deduction variables. In those variables they fail to be ready for school. In variables Writing, Relational vocabulary and Relation-comprehension they barely achieved the level of school

readiness. After seven months of attending school, 63.2% of disadvantaged children were not mature enough for school, according to the DIFER test.

Discussion and Conclusion

The results of this study highlighted the importance of the frequent Physical Education classes with suitable content. It has been proved that the development level of motor abilities significantly contributes to basic skills indispensable for learning, as well as to the development of social skills. The development and improvement of motor abilities with children from lower social status is increasingly essential as early as kindergarten age, as well as in the early stages of school studies. The level of learning competences is directly influenced by the conditional and coordination variants of the children. The fact that disadvantaged children lag behind in terms of physical fitness means that they will slowly fall behind in development, so their endurance will also decrease. Since the level of development of these factors will define the pupils' rate of success in Physical Education activities (or lack thereof), it can hardly be expected of children from disadvantaged background to muster much enthusiasm for school or after-school fitness activities.

One of the key aims was to find those possibilities during motor abilities development, which will lead to an improvement of the implicit level of motor skills in kindergarten and the early stages of school. Teachers can have an important role during this period in helping parents to direct their children's activities properly, thus empowering an overall child's development. It is important to include elements that have been proved to stimulate children's mental development during preschool age, with all specific exercises that help develop movement coordination and motor abilities, by which disruption of concentration and attention in the later period of life can be prevented (Rajović, 2011).

In those preschool facilities where disadvantaged children from lower social status are enrolled in a large number, a straightforward form of motor abilities development ought to be implemented. These disadvantages can be levelled out by recreational programmes and healthy physical activity (Borkovits, 2013; Schaub, 2010). All successful programmes involve repeated practice and progressively increase the challenge to executive functions. Children with poorer executive functions may avoid widening achievement gaps later (Diamond & Lee, 2011) through early executive-function training. It is a development programme that does not require a great amount of time, yet along with the traditional improvement methods it may offer further help for preparing disadvantaged children for academic learning. Better results in motor abilities of girls may be explained by a faster maturation of girls; the "more mature" they are, the faster the impulses flow towards muscles and also from the muscles to the CNS, so the results of the general motor behaviour were better (Lepeš et al., 2014; Szakály, 2008).

In the past few decades school education has provided fewer and fewer possibilities for motor development in Physical Education classes. Unlike kindergarten, primary school is bound to follow the set curriculum, and cannot deviate from it. However, in disadvantaged regions, where disadvantaged children of parents with low-level educational qualifications attend school, it is extremely advisable to set aside some amount of time on a daily basis for the further development of motor abilities. This time could be used in the form of the regular few-minute breaks in the middle of lessons aimed at improving motor skills, but the child will feel refreshed after the physical activity and continue the lesson with better performance.

The main characteristic of the developing material is its interdisciplinary approach. The implemented tools include music, movement, and the use of some physical objects. The content of the afternoon sports programme was created and formed taking into consideration the equipment generally available at schools. Physical activities, together with a healthy lifestyle can affect the quality of life, which in turn is connected with health (Vuillemin et al., 2005).

Physical activity is positively related to academic achievement (Coe et al., 2006), cognitive functioning (Ellemberg & St-Louis-Deschenes, 2010) and physical and general self-validation (Crocker et al., 2008). It also prepares children for a healthy lifestyle and independence in the labour market (Egressy, 2005). Through movement they gain positive experiences and recover their physical, mental, and emotional energy. It cannot be disregarded that children in disadvantaged families are often left without parental support, so it is the school's task to ensure proper development of physical skills which would ensure academic success.

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Motoričke sposobnosti i spremnost za školu djece s posebnim potrebama

Sažetak

Motorički razvoj u kojem postoje različite faze vrlo je važan. Posljedica nepostojanja različitih faza vjerojatno bi bili problemi u fizičkom, socijalnom i psihološkom razvoju. Fizička aktivnost pozitivno je povezana s akademskim postignućem (Coe, Pivarnik, Womack, Reeves i Malina, 2006.), kognitivnim funkcioniranjem (Ellemberg, 2010), fizičkim i općim samovrednovanjem (Crocker, Kowalski & Hadd, 2008). Nažalost, nema svako dijete mogućnost za zdravi motorni razvoj. Štoviše, većina djece s posebnim potrebama započinje školovanje s posebnim socijalnim, kulturnim i obrazovnim potrebama. Cilj je ove studije ocijeniti razlike između normalno razvijene djece iz prvoga razreda osnovne škole i djece s posebnim potrebama u područjima spremnosti za školu i motornih sposobnosti. Baterija 7 testova spremnosti za školu (DIFER) i 7 motornih testova provedena je na uzorku od 19 djece s posebnim potrebama (M = 7,56; SD = 0,87) i 25 normalno razvijene djece (M = 7,53; SD = 0,35). Značajne razlike (F = 5,43; p ≤ 0,05) među skupinama uočene su u oba područja; djeca s posebnim potrebama značajno su zaostajala za vršnjacima iz većinske skupine. U predškolskim i osnovnoškolskim ustanovama u kojima su u velikom broju upisana djeca s posebnim potrebama iz nižega socijalnog sloja treba primijeniti neposredni oblik razvoja motornih vještina. Razvojni program pružio bi daljnju pomoć za pripremu djece s posebnim potrebama za akademsko postignuće.

Ključne riječi: *akademsko postignuće; djeca prvog razreda; motorički razvoj.*