

THE SIGNIFICANCE OF PHYSICAL ACTIVITY OF YOUNG SCHOOLCHILDREN

UDC 796.012:371.31-053.5

**Dragana Mitraković¹, Maja Batez¹, Marijana Simić¹,
Milena Mikalački¹, Milenko Janković²**

¹Faculty of Sport and Physical Education, University of Novi Sad, Serbia

²College of Vocational Studies for Preschool Teacher Education, Vršac, Serbia

Abstract. *One of the priority objectives of physical education in elementary school is a positive impact on all basic motor abilities. Additional physical activity in the form of training, according to most previous studies, increases the positive effects of physical education. In a sample of 266 second, third and fourth grade elementary school children attending the "Jovan Popovic" school in Sremska Mitrovica, the motor abilities of children with different levels of physical activity were investigated. The comparison of the schoolchildren who participated in the organized extracurricular activities and those schoolchildren involved in physical education classes as the only form of physical activity was conducted. The assessment of motor abilities was carried out based on the following battery of tests: the long jump, running 20m, obstacle course backwards, deep forward bend, body bend and folding endurance. The application of the multivariate (MANOVA) and univariate (ANOVA) data analysis and the obtained research results led to the conclusion there are statistically significant differences between these two groups, at the level of statistical significance of $p < 0.05$, which means that extracurricular physical activities contribute significantly to the development of motor abilities in young schoolchildren.*

Key words: *motor abilities, physical activity, extracurricular activities, sport, younger schoolchildren*

INTRODUCTION

Every physical activity is founded upon the basic motor abilities that, influenced by different factors, can change in a positive or negative sense.

The positive aspects of regular physical activity are evident in physical and mental health, and psychosocial development. It is never too early to begin adopting healthy

Received June 15, 2016 / Accepted February 1, 2017

Corresponding author: Mirjana Simić

Faculty of Sport and Physical Education, University of Novi Sad, Lovćenska 16, 21000 Novi Sad, Serbia

Phone: +381 21450-188 • E-mail: marijanas15@gmail.com

habits and education about the importance of physical activity: studies show that most children who are involved in sports and are physically active in childhood maintain these habits later when they grow up. Young people can achieve significant health benefits from participating in physical activities of moderate and high intensity in intervals which can extend up to 60 minutes or more every day (Ostojic et al., 2009). Sport has a positive effect on the development of personal traits - children who are engaged in some sporting activity from an early age very early develop work habits and self-discipline. On the other hand, sport has a positive role in the emotional development of children since it facilitates the process of their socialization. Sport and physical activity may prevent excessive obesity in childhood and, of course, in adulthood. Through sport and physical activity, a child learns how to win and accept defeat, how to fair play in games and life, and develop friendships.

The early school age period is very suitable for raising awareness about the importance of physical education, the creation of habit of physical exercise, the development of the motor abilities of pupils. Thus, it is necessary to introduce children to the influences of the optimal level of physical activity, especially at this age. Bala (2014) concludes that even acute physical activity has positive effects on the intellectual abilities of children. Children who solved a mathematical test after physical activity were more successful than children who did not enforce physical activity prior to mathematical tasks.

A child who has a high level of motor abilities will be physically active, positively accepted by its peers, will be among the first to be selected in various games, while the child who is falling behind in the development of fundamental motor skills, only eventually would be elected for a teammate in the game, but would be among the first to be caught in certain games etc. (Netelenbos, 2005). The way in which children experience physical activity in childhood has an effect on subsequent involvement in adulthood. Negative attitudes adopted in youth can be transferred into adulthood and affect the willingness of people to engage in physical activities (Bailey, 2006; Barnett, Van Beurden, Morgan, Brooks, & Beard., 2009; Cliff, Okely, Smith, & McKeen, 2009; Haugen, Safvenbom, & Ommundsen, 2011).

A lack of activity negatively affects mood and mental function. Children from 7-11 years old, who were involved in a daily program of physical activity for 40 minutes, reduced their symptoms of depression and had more confidence than the control group (Petty, Davis, Tkacz, Young-Hyman, & Waller, 2009). Lack of involvement in physical activities contributed to the reduction of the physical form in children (flexibility, muscle strength, cardiorespiratory forms) as well as to the increased risk of morbidity (Boreham & Riddoch, 2001, Eisenmann, 2003).

Exercise can improve the body composition of obese young people by reducing the overall level of body fat, as well as visceral fat. Research shows that fat can be reduced by regular exercise of a moderate to high intensity, 3 to 5 times a week for 30 to 60 minutes (Centre for Health, Exercise and Sport Science, 2015). Sensitive stages for the improvement of the dominant motor functional abilities (speed, flexibility, coordination) are in the period from 7 to 11 years of age (Obradović, 2012), the period from the first to the fourth grade so it is essential that the task of creating school curricula and implementing methods of teaching be overtaken by those who are trained for it. It is necessary to monitor the motor status of pupils, regularly test and analyze their results, as well as give recommendations to parents on how to stimulate their children to get involved in sports or additional corrective activities, all to ensure their proper growth and development.

Since the 1960s, experts in the field of physical culture have increasingly been speaking and writing about the problems that younger schoolchildren face. Thus Milica Sepa, almost half a century ago, formulated one of the basic principles of teaching in physical education.

Ms. Sepa says that the younger the child, the more significant the role of physical education; moreover what is missed in the physical education of a child in primary school can hardly be compensated, and sometimes not compensated at all (Milanović, 2006).

For all these reasons, it is necessary to teach children the importance of practicing physical activity and include it in their daily tasks. We were interested in the extent of the differences in the motor abilities between the children who, in addition to physical education, practiced some other form of physical activity and those children whose attendance in physical education classes was their only form of physical activity. The paper focuses on the motor abilities of pupils and their physical activity apart from physical education classes, and its aim is to determine the kind and extent of the differences observed in the motor abilities of younger schoolchildren at different levels of organized extracurricular physical activities.

METHODS

Sample of participants

The sample comprised a total of 266 second, third and fourth graders of the elementary school "Jovan Popovic" in Sremska Mitrovica, divided into two groups. The first group consisted of pupils who had been actively involved in sports for at least 6 months, who had 60-minute training sessions 3 to 5 times a week (122 participants), while the second group consisted of the pupils whose only form of physical activity was physical education (144 participants).

Sample of measuring instruments

To determine the level of the motor abilities of the schoolchildren, with the aim of monitoring and comparing the results, the motor abilities space of all the schoolchildren in the sample was estimated with a battery of six tests: bend in the sitting position, long jump, lifting the torso to sitting position in 30 seconds, folding endurance, 20m running, and the obstacle course backwards.

Method of data processing

The data obtained from the survey were analyzed using descriptive and comparative statistics. We tested the normality of distribution using the Koglomorov-Smirnov test (K-S test). In terms of comparative statistics, the significance of differences between the two groups was determined by the multivariate (MANOVA) and univariate (ANOVA) analysis of variance. The level of statistical significance was set at $p < 0,05$. The data obtained by the measuring were processed using the IBM SPSS Statistics 20 program.

RESULTS

Following the new research methodology, the results obtained by means of the descriptive statistics were analyzed first. The descriptive parameters of the motor variables of physically active pupils (athletes) indicate no statistically significant deviations from the normal distribution, which is supported by the value of the KS test (Table 1). The analysis of the minimum and maximum results shows a large range in almost all variables, which

tells us that the group of athletes is not homogeneous, which may be the result of the age of athletes, type of sport, and the length of practicing a certain activity.

Table 1 Descriptive statistics of motor variables of schoolchildren engaged in extracurricular activities (group 1) and schoolchildren with physical education classes as the only form of physical activity (group 2)

Variables	Groups	MV	Min	Max	SD	p
Long jump (cm)	group 1	130,15	90	173	20,00	0,779
	group 2	113,12	50	145	16,25	0,522
20m running (s)	group 1	4,86	4,05	5,73	0,35	0,803
	group 2	5,26	4,59	6,12	0,36	0,060
Polygon backwards (s)	group 1	11,76	7,99	16,50	1,75	0,710
	group 2	15,98	8,03	29,52	3,62	0,523
Bend forward (cm)	group 1	56,07	35	75	8,37	0,717
	group 2	53,16	29	77	9,23	0,726
Body bend 30s (freq.)	group 1	19,43	12	29	3,40	0,092
	group 2	16,88	10	29	4,21	0,074
Folding endurance (s)	group 1	23,29	10,12	40,94	9,17	0,115
	group 2	8,501	0,00	24,85	6,35	0,132

MV – mean value; MIN - minimum; MAX - maximum; SD – standard deviation;
P- significance of Kolmogorov-Smirnov test

Descriptive parameters of the motor variables of the schoolchildren with physical education classes as the only form of physical activity also indicate no statistically significant deviation from the normal distribution (P).

After the observed differences in arithmetic means, it was necessary to determine whether the observed differences were statistically significant or not. The multivariate analysis of variance reported a statistically significant difference between the analyzed groups in the system of applied variables at the level of statistical significance $p=0,000$ (Table 2).

Table 2 Differences in individual variables of the schoolchildren's motor status

Variables	f	p
Long jump	58,662	0,000
20m running	80,526	0,000
Obstacle course backwards	135,618	0,000
Bend forward	7,045	0,008
Body bend 30s	28,569	0,000
Folding endurance	239,277	0,000

f – 48,029

f – value of univariate relation of F test

F – multivariate Wilks' F test; P – significance of the difference in the system of variables

Based on the obtained values of the univariate analysis of variance and the F relationship value of the univariate test (Table 2), it can be concluded that there are statistically significant differences in all variables at the level of $p=0,000$ between the pupils with different levels of physical engagement in the motor status.

DISCUSSION

In accordance with the research objectives, the motor abilities of the two groups of pupils were tested, the focus being on the differences between those who were, in addition to physical education, involved in other organized types of physical activity (sport games, athletics, gymnastics, recreational programs, etc.) and those who were not engaged in any form of extracurricular physical activities. The analysis of the minimum and maximum values shows a wide range, especially in the variable of the obstacle course backwards. By comparing the arithmetic means of the participants, one can observe higher scores in favor of the participants engaged in extracurricular activities in all the variables (long jump, bend, body bend, folding endurance), except for the variables 20m running and obstacle course backwards, because those are the inverse variables where a higher score is worse, so we can already say that better results were achieved by the first group, as expected. The results indicate that Group 2 has children who lag behind their peers in coordination. Hraski and Živčić (1996) investigated the influence of programmed physical exercises on the motor potential of children. Children who have practiced programmed physical activities every day from 45 to 60 minutes achieved significantly better results in coordination, flexibility and strength tests. The authors believe that daily organized physical activity can influence the development of the motor skills of children.

It may be noted that the children in Group 2 have extremely low static strength of the arms and shoulders. Activities such as climbing, resistance, crawling and so on, encourage the development of the already mentioned segments and this leads us to think that classes of physical education should practice more natural forms of movement. That fact is confirmed in study of Maslov (1982), which concludes that children thanks to the experience gained through motor ball games, climbing trees and running, have better results in strength, coordination and running speed tests.

Based on the results of the research of the motor status, the differences were determined between the groups at the $p=0,000$ level of statistical significance in all the variables and system variables. Given that these are participants of the same age, from the same city, of similar or almost the same socio-economic status, it can be said that this difference is due to the differences in the level of physical activity. This difference indicates that the level of physical activity has an important role in the development of motor abilities in young schoolchildren. It can be concluded that systematic, adequate exercise and organized exercising, professionally guided, yield positive results regarding the changes of the motor abilities in young schoolchildren. Kopas, Obadov and Drid (2008) suggest that the development of the motor abilities of the schoolchildren is more effective under the influence of a systematic judo training when compared to the physical development of the pupils who only attend school physical education classes.

The results of this study are consistent with results of Jonić, Projović, & Janković (2009); Sabo (2002), which indicate better results in the motor skills tests of children who were more physically active than children who were less physically active or their only form of physical activity was teaching physical education. Children who have been involved in organized programs for the development of motor skills achieved better results in the tests for assessment of the reaction rate, accuracy, balance, compared to children who had not been involved in these programs (Diem, Lehr, Olbrich, & Undeutsch, 1980).

Physically active and inactive children go through the same stages of development. Allowing children to be physically active is very important to provide adequate opportunities

for the development of various skills in children. The good quality of a physical education program is based on the knowledge of the patterns of growth and development as well as the developmental stages of children that are of critical importance for the planning of adequate portrayal of experiences that promote the development of motor skills (Clark, 2005).

The results of Badrić, Prskalo and Sporiš's study (2015) showed that training process for a period of 8 weeks, upon completion caused significant changes in motor skills of girls who were involved in additional extracurricular activities. Similar results were showed in study of Klinc (2008); Zukolo (2007); Milanović, Jukić, & Itoudis (1994), Blašković, Matković, & Matković (1993).

Reduced levels of physical activity brought us to the fact that an increasing number of children do not meet the recommended amount of 60 minutes of moderate to intense physical activity per day (Mackintosh, Knowles, Ridgers, & Fairclough, 2011).

Children who have poor motor skills are less engaged in physical activity in their free time, and based on that their competence it is getting worse, they do not want to play and compete with their peers, leading to a lower acceptance by peers (Henderson & Sugden, 1992; Vannata, Gartstein, Zeller, & Noll., 2009). These relationships are more pronounced in boys than in girls. Teachers have found that children with poor motor skills face rejection by their peers even in activities that take place in classrooms (Livesey, Lum, Toshack, & Zheng, 2011).

Significantly better results of children from the Group 1 in tests for motor abilities can be explained by a greater physical involvement, including greater presence of physical games as confirmed by research (Lindsey and Mize, 2001; Pellegrini, 1989; Di Pietro, 1981).

CONCLUSION

The results of this research indicate how regular physical activity contributes to the improvement of motor abilities, as well as emphasize the importance of practicing the same. Physical activity is one of the easiest ways to maintain and improve health. It promotes the growth and development of children and young people, increases self-confidence, self-esteem, sense of fulfillment and satisfaction.

Physical education based on motor activity achieves certain goals and tasks of teaching. Consequently, it is essential that students are properly engaged. Physical education teachers and all experts in this field have to structure and apply appropriate concrete action to encourage the development of motor skills and physical activity programs, such as physical education. It should be based on motor activities that enhance self-efficacy, and satisfaction of children and young people in participating in physical activities.

Extracurricular activities that children attend in most of the cases require financial support and therefore children who are unable to pay a membership fee remain deprived of additional physical activity. In that age, physical education teachers and family members have the greatest impact on children's physical activity. Each new learned motor activity enriches motor skills of the child. Modern lifestyle has a negative impact on the psychological state of the body, particularly in the period of its development. These facts oblige physical education teachers that in addition to regular classes, organize additional forms of physical activity as well, through the various sections, additional teaching classes, trips, camping and so on, and parents to spend more free time with children and point out the importance of physical activity.

It is necessary to raise people's awareness of the importance of preservation, and improvement of their health, as well as to stimulate them to increase the level of regular physical activity.

REFERENCES

- Bailey, R. (2006). Physical education and sport in schools: A review of benefits and outcomes. *Journal of School Health*, 76(8), 397-401.
- Bala, G. (2014). The effects of acute physical exercise training on mathematical computation in children. *Annales Kinesiologiae*, 1, (5), 15-22.
- Blašković, M., Matković, B., & Matković, B. R. (1993). Utjecaj tjelesne aktivnosti na razvoj nekih bazičnih motoričkih sposobnosti kod dječaka. *Kineziologija*, 25(1-2), 33-38.
- Barnett, L., Van Beurden, M. E., Morgan, P. J., Brooks, L. O., & Beard, J. R. (2009). Childhood motor skill proficiency as a predictor of adolescent physical activity. *Journal of Adolescent Health*, 44(3), 252-259.
- Boreham, C., & Riddoch, C. (2001). The physical activity, fitness and health of children. *Journal of Sports Sciences*, 19(12), 915-929.
- Centre for Health, Exercise and Sport Science (2015). Active youth for a healthier life: health, lifestyles and physical fitness of young people. Posted on September 22, 2015 from the World Wide Web: <http://www.chess.edu.rs/projekat-mos-smernice-za-fizicko-vezbanje/>
- Clark, J. E. (2005). From the beginning: a developmental perspective on movement and mobility. *Quest*, 57(1), 37-45.
- Cliff, D., Okely, A., Smith, L., & McKeen, K. (2009). Relationships between fundamental movement skills and objectively measured physical activity in preschool children. *Pediatric Exercise Science*, 21(4), 436-449.
- Diem, L., Lehr, U., Olbrich, E., & Undeutsch, U. (1980). *Langsschnitt untersuchung über die Wirkung frühzeitiger motorischer Stimulation auf die Gesamtentwicklung des Kindes im 4. bis 6. lebensjahr (Sectional examination of the effect of an early motor stimulation on the overall development of the child in the 4th to 6th year of life)*. Schorndorf: Hofmann. In German
- DiPietro, J. A. (1981). Rough and tumble play: A function of gender. *Developmental Psychology*, 17, 50-58.
- Eisenmann, J. C. (2003). Secular trends in variables associated with the metabolic syndrome of North American children and adolescents: A review and synthesis. *American Journal of Human Biology*, 15(6), 786-794.
- Haugen, T., Safvenbom, R., & Ommundsen, Y. (2011). Physical activity and global self-worth: The role of physical self-esteem indices and gender. *Mental Health and Physical Activity*, 4(2), 49-56.
- Henderson, S., & Sugden, D. (1992). *Movement assessment battery for children*. Kent, UK: The Psychological Corporation.
- Hraski, Ž., & Živčić, K. (1996). *Mogućnost razvoja potencijala djece predškolske dobi (The possibility of the development of potential in children of preschool age)*. In: D. Milanović (Ed.). Book of proceedings, (pp. 16-19). Zagreb: Faculty of Physical Culture. In Croatian
- Jonić, Z., Projojić, A. & Janković, I. (2009). Efikasnost različitih programa fizičkih aktivnosti dečaka predškolskog uzrasta (The efficiency of different physical activity programs with pre-school boys). *Glasnik Antropološkog društva Srbije*, (44), 217-226. In Serbian
- Klinc, F. (2008). An intensive combined training program modulates physical, physiological, biomotoric, and technical parameters in women basketball players. *The Journal of Strength and Conditioning Research*, 22(6), 1769-1778.
- Kopas, J., Obadov, J., & Drid, P. (2008). The differences in morphological characteristics and motor abilities of young judo practitioners and primary school pupils. *Glasnik Antropološkog društva Srbije*, 43, 212-219
- Lindsey, E. W., & Mize, J. (2001). Contextual differences in parent-child play: Implications for children's gender role development. *Sex Roles*, 44(3), 155-176.
- Livesey, D., Lum, M. M., Toshack, T., & Zheng, Y. (2011). The relationship between motor performance and peer relations in 9- to 12-year-old children. *Child: Care, Health and Development*, 37(4), 581-588.
- Mackintosh A. K., Knowles, R. Z., Ridgers, D. N., & Fairclough, T. S. (2011). Using formative research to develop CHANGE: a curriculum-based physical activity promoting intervention. *BMC Public Health*, 11(831). doi:10.1186/1471-2458-11-831
- Maslov, H.A. (1982). *Motivacija i ličnost (Motivation and personality)*. Belgrade: Nolit. In Serbian
- Milanovic, I. (2006). *Efektii programirane nastave fizičkog vaspitanja u mladem školskom uzrastu (Effects of programmed physical education in early school age children)*. Master thesis, Belgrade: Faculty of Sport and Physical Education. In Serbian
- Milanović, D., Jukić, I., & Itoudis, D. (1994). Utjecaj programiranog treninga na promjene u motoričkim sposobnostima mladih košarkaša (Influence of programmed training on changes in motor skills of young basketball players). *Kineziologija*, 26 (1-2): 33-43. In Croatian

- Netelenbos, J. B. (2005). Teacher's ratings of gross motor skills suffer from low concurrent validity. *Human Movement Science*, 24(1), 116–137.
- Obradovic, J. (2012). *Osnove antropomotorike (Basics of anthropomotorics)*. Novi Sad: Faculty of Sport and Physical Education. In Serbian
- Ostojic, S. M., Stojanovic, M., Veljovic, D., Stojanovic, M. D., Medjedovic, B., & Ahmetovic, Z. (2009). *Physical activity and health: Definition of the problem, contemporary views and recommendations*. *TIMS Acta*, 3, 1-13.
- Pellegrini, A. D. (1989). Elementary school children's rough-and-tumble play. *Early Childhood Research Quarterly*, 4, 245–260.
- Petty, K. H., Davis, C. L., Tkacz, J., Young-Hyman, D., & Waller, J. L. (2009). Exercise effects on depressive symptoms and self-worth in overweight children: A randomized controlled trial. *Journal of Pediatric Psychology*, 34(9), 929-939.
- Sabo, E. (2002). Struktura motoričkog prostora i razlike u motoričkim sposobnostima dečaka predškolskog uzrasta pri upisu u osnovnu školu (Structure of motor space and differences in motor abilities of pre-school boys in enrollment at primary school). *Fizičkakultura*, 56(1-4), 10-17. In Serbian
- Vannatta, K., Gartstein, M. A., Zeller, M. & Noll, R. B. (2009). Peer acceptance and social behavior during childhood and adolescence: How important are appearance, athleticism and academic competence? *International Journal of Behavioral Development*, 33(4), 303–311.
- Zukolo, Z. (2007). *Utjecaj šestomjesečnog treninga na promjene u nekim varijablama bazičnih motoričkih sposobnosti kod mladih košarkaša (The impact of the six-month training on changes in certain variables of basic motor skills in young basketball players)*. In: V. Findak (Ed.), 16. Summer School of Croatian Kinesiologists. Anthropological, methodical, methodological and technical assumptions of work in the areas of education, sport recreation, sport and physical training. Book of proceedings (pp. 274-282). Zagreb: Croatian Kinesiology Association. In Croatian

ZNAČAJ FIZIČKE AKTIVNOSTI MLAĐE ŠKOLSKE DECE

Jedan od prioriteta ciljeva fizičkog vaspitanja u osnovnoj školi je pozitivan uticaj na sve osnovne motoričke sposobnosti. Dodatna fizička aktivnost u vidu treninga, prema većini prethodnih istraživanja, povećava pozitivne efekte fizičkog vaspitanja. Na uzorku od 266 dece drugog, trećeg i četvrtog razreda osnovne škole "JovanPopović" u Sremskoj Mitrovici, istraživane su motoričke sposobnosti dece sa različitim nivoima fizičke aktivnosti. Sprovedeno je poređenje učenika koji su učestvovali u organizovanim vannastavnim aktivnostima i onih učenika koji su uključeni u časove fizičkog vaspitanja, kao jedini oblik fizičke aktivnosti. Procena motoričkih sposobnosti izvršena je na osnovu sledeće baterije testova: skok udalj, trčanje 20m, trčanje unazad preko prepreka, dubok pretklon, savijanje tela i izdržljivost. Primenjena je multivarijantna (MANOVA) i univarijantna (ANOVA) metoda u obradi podataka, i na osnovu dobijenih rezultata može se zaključiti da postoje statistički značajne razlike između ove dve grupe ($p < 0,05$), što znači da vannastavne fizičke aktivnosti značajno doprinose razvoju motoričkih sposobnosti mlađe školske dece.

Ključne reči: *motoričke sposobnosti, fizička aktivnost, vannastavne aktivnosti, sport, mlađa školska deca*