https://doi.org/10.7251/SSH2402179P
Original scientific paper
UDC: 572.087-053.6:796/799
Originalni naučni rad

The Impact of Extracurricular Physical Activities on the Development of Motor Skills and anthropometric characteristics in 12 Year School Children

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Abstract: *This study aims to establish differences in anthropometric characteristics and motor-basic skills between children who actively engage in sports outside of regular learning activities and those who are inactive. The study included 100 male children aged 12 years, from elementary school "TREPÇA" in Istog. Fifty of them are actively involved in different sports, while the other fifty are not active besides the school PE classes. The methods used to achieve the objectives of this study include descriptive statistical methods (measures of central tendency, distribution, and correlations), as well as the T-test method to confirm differences between the groups. The results were analysed using SPSS 20.0 software. In the anthropometric domain, statistically significant changes are observed in all variables except for thigh circumference, and these changes favour active children. Similarly, there are statistically significant changes in motor skills in all variables, except for the variable of standing long jump, again in favour of active children. Based on the anthropometric parameters, it can be concluded that the biological development and growth of these children are normal for their age. The distribution of results in anthropometric and motoric variables is normal, with slight asymmetry and predominantly positive values. After analyzing the results, it is clear that statistically significant changes were observed in most of the assessments conducted in this study. In the anthropometric domain, significant statistical differences were found in all variables except arm span. Likewise, in the basic motor skills domain, the active student group consistently outperformed their inactive peers in all tests, indicating higher proficiency levels among the active cohort.*

Keywords: *Extracurricular Activities, Physical development, Motor Skills, Differences.*

INTRODUCTION

With the advancement of modern technology, a decrease in the time spent by individuals engaging in various activities has been observed, allowing for more leisure time. However, this technology tends to make individuals more passive in its use, along with increased access to electronic devices. This passivity is also evident among primary school students, who often spend their free time passively, including watching television, playing video games, and using other technological devices. During this critical period of their development, physical activity is a key factor for healthy growth and development of children. Previous research unequivocally indicates that a high level of physical activity of children is closely related to a high level of motor skills (Fisher et al., 2005). Here are some of the positive effects of regular physical activity among them. Improved heart and blood vessel health, muscle, and bone growth improved mental health, maintenance of a healthy weight, improved cognitive intelligence, improved immune system, improved hormonal balance, improved social skills, prevention of chronic diseases, decreased risk of depression and anxiety (Burhaein, Tarigan, et al., 2021). The lack of necessary movement for the body can lead to limitations in basic motor skills and laziness. One of the main reasons for this laziness is the lack of activity and insufficient movement. However, with the increasing access to technology and the rise in the standard of living, there are also opportunities to encourage physical activities among children. Those who engage in free activities (such as sports or team games) meet their needs for movement and are more oriented towards healthy growth and development. To address this problem more systematically, a study has been conducted in a primary school, where a low level of motor skills was observed among students. The aim of the study is to prove the impact of extracurricular physical activity on the development of anthropometric characteristics which are related to the longitudinal factor and the circumference of the upper and lower extremities as well as explosive strength of legs and arms and speed of arm movement frequencies as important movement skills for the age of the students with whom the research was carried out.

Batričević (2008.) had made discriminative analysis of motor and functional abilities between sport active and inactive pupils and concluded that sportsmen are at a much higher level than non-sportsmen when it comes to explosive strength, sprint speed, vital lung capacity, systolic and diastolic arterial blood pressure, and that the difference between is statistically significant. According to the study by Ross, C. E., & Wu, C. L. (2011), there is a positive link between physical activity and academic performance in adolescents. They found that adolescents who were more engaged in physical activities had better academic outcomes compared to those with lower levels of physical activity.

Research Objective:

The aim of the study is to verify differences between groups of students actively participating in sports clubs and those who only attend regular physical education classes in school, in both motor and anthropometric spaces.

Sample of Participants:

The sample consists of 100 sixth-grade male students, aged 12 years ± 6 months from Kosova, from "Trepça" primary school in Istog municipality. Among them, 50 students of the same age participate in regular exercises in various sports, while the other 50 do not engage in any regular sports activities, except for 2 hours of physical education at school.

Sample of Variables:

Anthropometric Variables:

Body Weight: Kilograms (kg). Body weight is measured using a digital scale. The individual stands barefoot on the scale, with the weight evenly distributed between both feet.

Body Height: Centimeters (cm). Height is measured using a stadiometer. The individual stands straight with their back against the stadiometer or wall, heels together, and arms at their sides. The head is positioned so that the Frankfurt plane is parallel to the floor.

Length of the Arm: Centimeters (cm). Arm length is measured from the acromion (bony point on the shoulder) to the tip of the middle finger with the arm extended naturally by the side. A measuring tape is used for this.

Arm Span: Centimeters (cm). Arm span is measured by having the individual stand against a wall with their arms fully extended horizontally. The distance from the tip of one middle finger to the other middle finger is measured using a measuring tape or wall-mounted ruler.

Length of the Leg: Centimeters (cm). Leg length is measured from the top of the greater trochanter (hip bone) to the floor with the individual standing straight. A measuring tape is used to take this measurement on the outer side of the leg.

Thigh Circumference: Centimeters (cm). Thigh circumference is measured at the midpoint between the hip and the knee (often the largest part of the thigh) while standing with feet slightly apart. A flexible measuring tape is used to wrap around the thigh to obtain the measurement.

Calf Circumference: Centimeters (cm). Calf circumference is measured at the widest part of the calf muscle while the individual is standing with weight evenly distributed. A flexible measuring tape is used for this measurement.

Basic Motor Skills Variables:

Standing Long Jump: Centimeters (cm). The individual stands behind a marked line with feet shoulder-width apart. Without a running start, they jump as far forward as possible, landing on both feet. The distance from the starting line to the nearest point of contact on the landing (usually the heels) is measured using a measuring tape.

Standing High Jump: Centimeters (cm). The individual stands next to a vertical measuring device (wall-mounted ruler). They jump from a standing position and reach upward as high as possible. The highest point touched by their fingertips is recorded, and the difference between standing reach height and jump height is calculated to determine the jump distance.

20m Sprint: seconds (s). The individual runs 20 meters as fast as possible from a standing start. Timing begins at the start signal and ends when the individual crosses the 20-meter mark. A stopwatch or electronic timing system is used to record the time.

Medicine Ball Throw: Centimeters (cm). The individual sits or stands behind a marked line and throws a 1-kilogram medicine ball as far forward as possible using a chest pass motion. The distance from the starting line to where the ball first lands is measured using a measuring tape.

3x10m Shuttle Run: seconds (s). The individual sprints back and forth between two lines that are 10 meters apart, completing three sprints for a total of 30 meters. Timing starts at the go signal and ends when the individual crosses the finish line. A stopwatch or electronic timing system is used to record the time.

Chest Pass: Centimeters (cm). The individual stands behind a marked line and throws a basketball from chest height using both hands, aiming for maximum distance. The distance from the starting line to where the ball first lands is measured using a measuring tape.

Wall Pass: (number of passes in a 10 sec). The individual stands at a set distance from a wall and throws a ball against it, attempting to complete as many consecutive passes as possible within a 10 seconds. The total number of successful passes made is recorded.

Statistical Analysis:

The methods applied in this paper include descriptive statistical methods (measures of central tendency, dispersion), as well as scientific methods of condensing and transforming results. The results were processed using the computer program SPSS, version 27.0.

For each variable, central and dispersion parameters have been calculated. Differences in anthropometric characteristics and motor variables were determined using a discriminatory parametric procedure alongside a t-test for small independent samples, with a statistical significance of $p < 0.05$.

RESULTS

In the table nr. 1, are presented data regarding the discrepancy between two arithmetic means, T-test values, and significance levels. Upon analysing these outcomes, it becomes evident that statistically significant alterations have been detected across the majority of the assessments conducted in this study. Within the anthropometric space, notable statistical variances are evident across all variables, apart for arm span, where the active students (M = 150.40, SD = 13.06) showed the similar results compared to nonactive students (M= 148.42, SD=79.78) t (.916), p = .362.

Within the motoric space there are significant statistical differences in all variables at the statistical level p = .000 showing the dominance in favour of active group of students.

Table 1. *t – Test*

Group		N	M	SD	t	df	Sig.
Body Weight	Active	50	51.91	10.58	5.917	98	.000
	Nonactive	50	41.03	8.21	5.917	98	.000
Body Height	Active	50	157.38	9.37	5.894	98	.000
	Nonactive	50	147.74	6.75	5.894	98	.000
Length of the Arm	Active	50	68.40	4.98	4.826	98	.000
	Nonactive	50	64.35	3.22	4.826	98	.000
Arm Span	Active	50	150.40	13.06	.916	98	.362
	Nonactive	50	148.42	7.99	.916	98	.362
Length of the Leg	Active	50	91.360	6.67	5.008	98	.000
	Nonactive	50	85.462	4.98	5.008	98	.000
Thigh Circumference	Active	50	49.48	5.61	3.380	98	.001
	Nonactive	50	45.69	5.60	3.380	98	.001
Calf Circumference	Active	50	33.62	3.51	4.289	98	.000
	Nonactive	50	30.85	2.90	4.289	98	.000
Standing Long Jump	Active	50	151.32	19.62	-.169	98	.001
	Nonactive	50	151.94	16.93	-.169	98	.001
Standing High Jump	Active	50	33.00	5.54	3.412	98	.001
	Nonactive	50	29.62	4.29	3.412	98	.001
20m Sprint	Active	50	4.12	0.27	-4.393	98	.000
	Nonactive	50	4.36	0.29	-4.393	98	.000

Medicine Ball Throw 1kg	Active	50	634.00	183.99	8.108	98	.000
	Nonactive	50	413.34	56.39	8.108	98	.000
3x10m Shuttle Run	Active	50	9.71	0.56	-5.514	98	.000
	Nonactive	50	10.59	0.98	-5.514	98	.000
Chest Pass	Active	50	847.00	1.20	4.393	98	.000
	Nonactive	50	734.01	1.37	4.393	98	.000
Wall Pass	Active	50	11.46	0.93	10.450	98	.000
	Nonactive	50	8.70	1.62	10.450	98	.000

DISCUSSIONS

Observations reveal that statistically significant shifts predominantly favour the active student cohort. This observation leads to the conclusion that consistent engagement in diverse sporting activities has substantially contributed to enhanced developmental outcomes concerning body height, extremity dimensions, and measurements of thigh and calf circumferences. Similarly, within the domain of basic motor skills, changes exhibited across all tests favour the active student group, denoting superior proficiency levels in this cohort compared to their inactive counterparts. Notably, the active student group demonstrates superior performance across variables assessing explosive arm and leg strength, as well as movement execution speed.

Through application of the T-test methodology, it becomes apparent that the active student cohort consistently outperforms their inactive counterparts across both anthropometric and basic motor skills domains, underscoring the significant benefits associated with regular engagement in physical activities. In the schools from which the participants were drawn, students receive only two hours of physical education per week. This limited exposure is insufficient to support the optimal physical development of children. In contrast, children who participate in extracurricular sports activities 3-5 times per week consistently demonstrated superior performance across nearly all tested variables, with particularly pronounced differences observed in motor skills. In comparison to existing literature, our findings echo those of previous studies that have explored the impact of extracurricular physical activities on anthropometric and motor skill development among school-aged children. For instance, a study The positive effects of the additional exercises program in addition to regular physical education classes are also indicated by the results of earlier research (Marković, 2017; Kukolj, 2006; Nešić et al., 2013). (Pireva et al. 2017) in the research conducted on a sample of 100 young pupils aged 14-15 The purpose of the study was to prove the possible difference between the basketball players and the pupils in some anthropometric characteristics, basic motor skills and situational motor skills. In order to define these changes of anthropometric characteristics, 18 motoric variables were applied for basic motor and situational motor skills. The results show that there are statistically significant differences and that there is a statistically significant difference between basketball players and pupils, where basketball players have better results in all tests of basic motor and situational motor skills. The results have shown that the regular engagement of children in basketball schools can enhance the skills and knowledge of young players and make a significant difference. Additionally, our study contributes to the existing body of literature by providing further insights into the specific anthropometric and motor skill parameters that are influenced by extracurricular sports participation. Such nuanced analyses add depth to our understanding of the multifaceted relationship between physical activity and developmental outcomes among school-aged children.

CONCLUSION

The results of this study indicate significant differences between students actively participating in extracurricular sports and those who only attend regular physical education classes, with the former group showing more favorable outcomes. These findings underscore the importance of increased engagement in regular physical activities, which significantly enhances children's anthropometric and motor development.

Additionally, our study extends the existing literature by offering specific insights into the anthropometric and motor skill parameters most affected by extracurricular sports participation. This detailed analysis contributes to a deeper understanding of the complex relationship between physical activity and developmental outcomes in school-aged children.

Moreover, our findings emphasize the need for educational programs that promote regular sports participation as a core component of children's physical development. By corroborating and expanding upon prior research, this study reinforces the value of evidence-based interventions aimed at improving the physical health and developmental trajectories of young learners.

LITERATURE

Arsenovic, D., Djokic, B., Kovacevic, Z., Stevanovic, D., Janicijevic, K., Petrovic, M. A., … Radovanovic, S. (2022). Quality of Life of Children Engaged in Regular Physical Activities. *Iranian Journal of Public Health,* 51(7), 1629–1636.

Bass, D., & Cale, L. (1999). Promoting Physical Activity through the Extra-Curricular Programme. *European Journal of Physical Education*, 4(1), 45–64.

Batričević, D. (2008). Discriminative analysis of motor and functional abilities between sport active and inactive pupils. *Sportlogia*, 1, 50-53.

Fisher, A., Reilly, J. J., Kelly, L. A., Montgomery, C., Williamson, A., Paton, J. Y., & Grant, S. (2005). Fundamental movement skills and habitual physical activity in young children. *Medicine and Science in Sports and Exercise*, 37(4), 684–688. https://doi.org/10.1249/01.MSS.0000159138.48107.7D

Jenko Miholić, S., Čižmek, A., & Persun, J. (2010). Differences in morphological characteristics and motor skills between athletes and non-athletic high school boys.

Kukolj, M. (2006). Anthropomotorics. Belgrade: Faculty of Sports and Physical Education, University of Belgrade.

Marković. (2017). Structure of the physical education lesson. Jagodina: Faculty of Pedagogical Sciences.

Nešić, G., Ilić, D., Majstorović, N., Grbić, V., & Osmankač, N. (2013). Training Effects on General and Specific Motor Skills on Female Volleyball Players 13-14 Years Old. *Sportlogia*, 9(2), 119–127. https://doi.org/10.5550/sgia.130902.en.007n

Pireva, F., Vehapi, S., Mikic, B., Pireva, A., Gashi, E., & Kelmendi, D. (2015). Differences in motoric and anthropometric space between 12-year-old boy basketball players and students. *Sport Science - International Scientific Journal of Kinesiology*, 8(2), pp. 25-30.

Turhaein, E., Tarigan, B., Budiana, D., Hendrayana, Y., & Phytanza, D. T. P. (2021). Physical Activity Level of Students with Disabilities during COVID-19 Pandemic. *Journal Pendidikan Jasmani Dan Olahraga*, 6(2). https://doi.org/10.17509/jpjo.v6i2.38547

Primljen: 20. maj 2024. / Received: May 20, 2024
Izmjene primljene: 18. septembar 2024. / Changes Received: September 18, 2024
Prihvaćen: 22. septembar 2024. / Accepted: September 22, 2024