

## THE INFLUENCE OF ORGANIZED PHYSICAL ACTIVITY ON PHYSICAL FITNESS

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### Abstract

*This study aims to investigate the influence of organized physical activity on the physical fitness of young individuals. A sample of 519 respondents, comprising 260 males and 259 females, was randomly selected from several primary schools in the Skopje region. The participants underwent a comprehensive physical fitness evaluation using the standardized EUROFIT battery, which assessed flexibility, grip strength, explosive power, abdominal endurance, and movement speed, agility, and coordination. The findings reveal that participation in organized physical activities significantly enhances various components of physical fitness, including cardiorespiratory and muscular fitness. These results emphasize the importance of fostering supportive environments that encourage active involvement in structured sports programs from an early age. By promoting accessible recreational options and emphasizing enjoyment over competition, communities can cultivate lifelong habits of active living, ultimately benefiting both individual well-being and public health outcomes.*

**Key words:** *organized physical activity, physical fitness, youth, cardiorespiratory fitness, muscular fitness*

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### Introduction

Today, insufficient physical activity emerges as one of the most critical and widespread threats to public health, with its adverse effects extending to both physical and psychological well-being. (Smith et al., 2022). It is imperative to acknowledge that a substantial proportion of young individuals fail to meet the recommended daily threshold of 60 minutes of moderate to vigorous exercise, as delineated by the World Health Organization (Global Action Plan on Physical Activity 2018–2030, 2023) (Archer, 2014). This recommendation aims to prevent the early onset of sedentary behaviors and unfavorable attitudes toward physical activity, which, if ingrained, are likely to persist into adulthood. Regrettably, current studies indicate that numerous children and teenagers already display at least one cardiometabolic risk factor, even though signs of cardiovascular disease may remain hidden until later in life (Drenowatz et al., 2019). The implications of these findings are concerning, as they highlight the urgent need for effective interventions and programs to promote physical activity among youth, fostering healthier lifestyles and reducing long-term health risks.

This calls for a collaborative effort among parents, educators, and healthcare professionals to create supportive environments that encourage active participation in physical activities from an early age (Lipnowski & LeBlanc, 2012)(Zeng et al., 2017). To effectively combat the rising levels of sedentary behavior among adolescents, it is essential to explore the role of organized sports as a catalyst for sustained physical activity. Research suggests that participation in structured athletic programs not only enhances cardiorespiratory and muscular fitness but also fosters social connections and teamwork skills critical during this developmental stage. However, the challenge remains that many youth drop out of these activities due to increasing competitiveness and time demands, which can lead to a decline in their health-related fitness over time (Logan et al., 2019)(Kohl et al., 2013). Therefore, promoting accessible recreational options that focus on enjoyment rather than competition may provide a viable solution, ensuring that all young individuals have opportunities to engage in regular physical activity regardless of their prior involvement in organized sports. This multifaceted approach could help cultivate lifelong habits of active living, ultimately benefiting both individual well-being and public health outcomes (Recommended population levels of physical activity for health, 2023).

By fostering an environment that prioritizes fun and inclusivity, communities can encourage greater participation in physical activities, reducing barriers that often deter youth from staying active. Creating programs that emphasize social interaction and skill development rather than performance can further enhance the appeal of these activities, making them more inviting for young people from diverse backgrounds. Such initiatives can also promote teamwork and cooperation, instilling valuable life skills that extend beyond physical fitness and into personal (Bangsbo et al., 2016)(Archer, 2014).

## **Materials and methods**

### *Study participants*

The survey was conducted on a sample of 519 respondents (mean age  $7.15 \pm 0.79$  years), drawn at random from several primary schools in the Skopje region. The sample is divided into two subsamples, according to gender: 260 male and 259 female respondents.

The sample included all students for whom parents added consent to participate in the project; who are psychophysically healthy and regularly attend physical and health education classes. In addition, those students who for some reason did not make all the measurements are excluded from the analysis. Also, students were informed about the anonymous and voluntary nature of their participation. Respondents were treated in accordance with the 1961 Helsinki Declaration (revision of Edinburgh 2013).

### *Physical fitness evaluation*

Before the initiation of the research study, the participating investigators underwent rigorous training to ensure the standardization, validation, and reliability of the measurement protocols. Seven assessments, which comprise the EUROFIT battery that has been validated and standardized by the European Council, were conducted in the subsequent order: 1. Sit-and-reach: The participant assumes a seated position on the floor and utilizes a standard box; the maximum distance attained by the fingertips during forward trunk flexion is recorded. This assessment serves to evaluate the range of motion or flexibility. Handgrip strength: The maximum grip strength for both hands is quantified utilizing a Takei TKK 5101 digital dynamometer. Standing long jump: The maximum horizontal distance achieved with feet positioned together is documented. This assessment evaluates the explosive power of the lower extremities. Sit-ups in 30 seconds: The maximum quantity of sit-ups executed within a 30-second timeframe is recorded. This evaluation measures the endurance capacity of the abdominal musculature. 4 x 10 m shuttle run test: This assessment offers a comprehensive evaluation of movement speed, agility, and coordination. The participant performs four shuttle runs as expeditiously as possible between two designated lines situated 10 meters apart, placing or retrieving an object adjacent to the line on the floor at each terminus. Cardiorespiratory fitness: Cardiorespiratory fitness (CRF) was assessed employing the 20-meter shuttle run test with progressive increments in velocity as delineated by Leger et al. Participants ran back and forth between two lines spaced 20 meters apart, with an auditory signal dictating the pace of running. The frequency of the beeps escalated, increasing the running speed by 0.5 km/h every minute from an initial speed of 8.5 km/h. The assessment concluded when the participants were no longer able to maintain the pace dictated by the audio signal, and the final stage achieved was utilized to estimate maximal oxygen uptake. This method not only provides a reliable measure of cardiorespiratory fitness but also allows for the evaluation of an individual's aerobic capacity in a controlled and standardized manner. The results obtained from this assessment can be instrumental in tailoring personalized training programs, as they highlight the individual's current fitness level and areas for improvement.

### *Participation in sports*

Parents were surveyed to determine if their child participated in sports or physical activities in a structured way. If the parents indicated that their child engages in sports, they were prompted to answer: (1) How many times did your child attend training sessions last week? (2) What is the typical duration of a workout? The findings were categorized into three groups: Never, 1-2 times a week, and 3-5 times a week.

### *Statistical analysis*

Descriptive statistics for the three groups of sports participation were calculated and checked for normal distribution. Differences in individual physical fitness parameters according to sport participation were calculated by applying a one-factor multivariate and univariate analysis of covariance, with age and gender partialization (age and gender were treated as fixed covariance), as well as post-hoc LSD tests. The data

were processed with the statistical packages SPSS for Windows Version 26.0 at the Center for Data Analysis and Processing of the Faculty of Physical Education, Sports and Health, Skopje.

## Results

In order to determine whether there are differences in motor status among the groups of subjects, formed in terms of days of the week, spent in organized sports activity, a multivariate and univariate analysis of covariance was applied with controlling for age and sex (the same were treated as fixed covariances), in order to neutralize their possible influence on the analysis.

Table 1. Differences in Motor Performance Among Participant Groups Based on Days per Week of Organized Sports Activity

	Value		F		Hypothesis df		Error df	Sig.	n <sup>2</sup>
Wilks' lambda	,86		4,18		18		994	,000	,070

  

	Never (1)		1-2 times per week(2)		3-5 times per week (3)		F	P	n <sup>2</sup>	Post hoc pairwise comparisons		
	Mean	SD	Mean	SD	Mean	SD				1-2	1-3	2-3
FLE	16,92	6,51	17,09	6,00	16,89	6,24	0,48	,622	,002	ns	ns	ns
HG	10,70	2,76	11,91	2,72	12,54	3,01	14,96	,000	,056	<	<	ns
RHG	0,38	0,09	0,41	0,09	0,43	0,10	7,06	,001	,027	<	<	<
SKOK	98,88	20,67	105,34	20,69	113,84	22,27	11,59	,000	,044	<	<	ns
SIT30	9,95	4,95	11,76	4,92	13,92	5,45	16,96	,000	,063	<	<	<
4X10M	16,16	2,00	15,59	2,14	14,70	2,28	10,40	,000	,040	<	<	ns
Stg	2,95	1,10	3,17	1,17	3,76	1,54	7,94	,000	,030	<	<	<
Dist	387,37	182,41	425,64	198,76	538,86	259,56	10,60	,000	,040	<	<	<
VO <sub>2</sub> max	48,93	2,54	49,40	2,54	50,50	3,08	10,38	,000	,039	<	<	ns

From the review of Table 1., which shows the results of the multivariate analysis of covariance performed, according to Wilks' lambda 0.86 and the level of statistical significance amounting to Sig .000, it is evident that there are statistically significant differences in motor status among the groups of respondents, formed in terms of days of the week, spent in organized sports activity.

In order to determine the separate contribution of each test in differentiating the groups, formed in relation to the days of the week, spent in organized sports activity, a univariate analysis of covariance was also applied. From a total of nine motor tests analyzed, in eight tests significant statistical differences were determined among the analyzed groups of subjects, hand grip dynamometry (HG) at the level of  $p = ,000$ , relative values obtained from the test hand grip dynamometry at the level of  $p = .001$ , standing long (SKOK) at a level of  $p = .000$ , sit-ups for 30 seconds (SIT30) at a level of  $p = .000$ , 4x10 m shuttle-run test (4x10m) at a level of  $p = .000$ , running at 20 meters with a progressive increase in speed (meters traveled) (Dist) at a level of  $p = .000$ , running at 20 meters with progressive increase in speed (sections) (Stg) at a level of  $p = .000$  and running at 20 meters with a progressive increase in speed (VO<sub>2</sub>max) at a level of  $p = .000$ . From the review of the arithmetic means and the level of statistical significance, it can be seen that the group that does not engage in organized physical activity, shows poorer results in tests assessing strength, explosive force, repetitive strength of the abdominal muscles, speed, agility and coordination, and cardiorespiratory endurance, relative to groups practicing 1-2 times a week and 3-5 times a week, organized sports activity. The group, which practices 1-2 times a week organized sports activity, showed poorer results in tests assessing the relative strength of the palm grip, the repetitive strength of the abdominal muscles and cardiorespiratory endurance, compared to the group that practiced 3-5 times a week organized sports activity. Statistically significant differences between the three groups were not determined only in the "Sit-and-reach" flexibility pre-assessment test.

## Discussion

The findings of this study suggest that children who regularly participate in organized sports activities, several times a week, exhibit superior overall physical fitness compared to their peers who do not engage in routine physical activity or only participate 1-2 times per week. These results corroborate previous research demonstrating that regular physical activity, including sports involvement, is consistently linked

to enhanced motor coordination, agility, strength, power, and endurance in children. (Fernandes et al., 2016) (Li et al., 2023) (Drenowatz et al., 2019)

Regular physical activity and sports participation during childhood are not only beneficial for physical fitness, but also have positive implications for academic achievement and cognitive function. Studies have found that children with better motor skills tend to perform better academically, potentially due to the overlap between the neural networks and cognitive processes involved in both physical and academic domains. (Kohl et al., 2013) Furthermore, physical activity has been linked to enhanced executive functions, including improved attention, inhibition, and cognitive flexibility - all of which are essential for academic success. (Fernandes et al., 2016)

Although the present study did not directly examine the relationship between physical fitness, sports participation, and academic achievement, the robust associations identified between physical activity levels and physical fitness measures suggest that encouraging sports and exercise in childhood may yield wide-ranging benefits beyond merely physical well-being.

The current study's limitations include its cross-sectional design, which precludes causal inferences, and the reliance on self-reported physical activity data. To better understand the relationships between childhood physical fitness, sports participation, and academic/cognitive outcomes, future longitudinal and experimental research is needed to elucidate the directionality and underlying mechanisms. (Fernandes et al., 2016) (Kohl et al., 2013) (Fisher et al., 2011)

Collectively, the findings from this and prior studies emphasize the importance of integrating regular physical activity and sports programs into children's daily routines, both within the school curriculum and in extracurricular contexts. Promoting physical fitness in childhood may have the potential to positively impact not only physical health, but also cognitive development and academic achievement. (Fernandes et al., 2016) (Kohl et al., 2013) (Fisher et al., 2011)

## Conclusion

The findings of this study indicate that children who regularly engage in organized sports activities demonstrate superior motor coordination and physical fitness compared to their less active peers. These results underscore the importance of promoting physical activity and sports participation in childhood, as they may yield wide-ranging benefits for both physical and cognitive development.

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