PHYSICAL ACTIVITY LEVELS IN FIRST AND SECOND GRADE SCHOOL-AGED CHILDREN

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ABSTRACT

Introduction: Physical activity is a key factor for children's growth and development, influencing both their physical and psychosocial well-being (Strong et al., 2005). However, data on levels of physical activity among early school-aged children (6-8 years) in North Macedonia are limited, making it essential to understand activity patterns in this age group.

Aim: The aim of this study is to evaluate the physical activity levels of children aged 6 to 8 years in a primary school in North Macedonia, focusing on gender and age-related differences.

Methodology: The sample consisted of 150 students (69 boys and 81 girls), specifically 72 from the first grade and 78 from the second grade, from Elementary school Gjorgjija Pulevski, Skopje, Republic of North Macedonia. Data were collected using the Children's Leisure Activities Study Survey (CLASS) (Telford et al., 2004), completed by parents, which provided insights into children's physical activity during leisure time. Physical activity levels were categorized according to the World Health Organization's (WHO) guidelines, which recommend that children should engage in at least 60 minutes of moderate-to-vigorous physical activity per day.

Results and Conclusions: The study aims to identify potential differences in physical activity levels based on gender and age. Boys were significantly more likely than girls to participate in sports (71.0% vs. 46.9%, p = .003). Alarmingly, 68.3% of girls reported no participation in sports, compared to 31.7% of boys. First graders were more active during weekdays than second graders (p < .05). Overall, many children, especially girls, did not meet the WHO recommendations for daily physical activity.

Keywords: *physical activity, school-aged children, CLASS.*

INTRODUCTION

Physical activity during childhood is essential for healthy growth and development, impacting not only physical fitness but also cognitive, emotional, and social well-being (Janssen & LeBlanc, 2010; Strong et al., 2005). The early school years, typically ages 6 to 8, are a critical period in establishing foundational movement skills and behavioral patterns that often persist into adolescence and adulthood (Telama et al., 2005). Regular participation in moderate-to-vigorous physical activity (MVPA) has been shown to reduce the risk of obesity, improve cardiovascular health, enhance musculoskeletal development, and support academic performance (Poitras et al., 2016; Donnelly et al., 2016). Regular physical activity is essential for the cognitive, physical, and psychosocial development of children. Evidence shows that both acute and chronic physical activity positively affect brain health and cognitive functions such as attention, memory, and processing speed (Donnelly et al., 2016). Moreover, structured and classroom-based physical activity interventions are associated with improved executive functioning and learning behavior, without negatively affecting academic performance (Poitras et al., 2016). Global surveillance of physical activity among children and youth reveals alarming trends. According to the Global Matrix 3.0 initiative, which assessed physical activity indicators in 49 countries, the average grade for overall physical activity was a "D," meaning that less than 40% of children meet the World Health Organization's recommendation of 60 minutes of moderate-to-vigorous physical activity per day (Aubert et al., 2018). This highlights a global concern about sedentary lifestyles and insufficient movement in childhood.

Socioeconomic context plays a significant role. Countries with higher Human Development Index (HDI), greater income equality, and better education systems tend to have more favorable physical activity profiles among children and youth (Tremblay et al., 2014). This suggests that national-level social and economic policies can support or hinder children's opportunities for physical activity. Despite global efforts to promote physical activity among children, many still fail to meet the World Health Organization's recommendation of at least 60 minutes of MVPA daily (WHO, 2020). This trend is particularly evident in transitional societies where lifestyle changes, increased screen time, and urbanization contribute to more sedentary behavior (Guthold et al., 2020). Reducing sedentary behavior, especially recreational screen time, is also emphasized, as replacing sedentary time with any physical activity provides health benefits (WHO, 2020). However, there is a lack of region-specific data on the physical activity levels of young school-aged children, especially in Southeast European countries such as North Macedonia.

Understanding the physical activity patterns of children in this age group is crucial for developing targeted interventions and public health strategies. This study seeks to address this gap by examining physical activity levels in first and second-grade children in North Macedonia, with attention to potential gender and age-related differences. The findings aim to inform educators, health professionals, and policymakers on how to better support active lifestyles during early childhood.

Aim and Objectives

The aim of this study is to evaluate the physical activity levels of children aged 6 to 8 years in a primary school in North Macedonia. The focus is on differences between boys and girls, as well as between first and second-grade children. The study looks at both organized sports and free-time physical activities that children choose on their own. Physical activity will be assessed over a full week (Monday to Sunday). The objectives of this study are to measure the physical activity levels of children aged 6 to 8 over a full week (Monday to Sunday), identify the most commonly practiced sports among boys and girls, compare activity levels between genders and between first and second grade children, determine how many children do not participate in any sport or physical activity, examine gender preferences in sports, explore the types of physical activities children engage in during their free time, and provide suggestions for encouraging greater physical activity, particularly among girls.

METHODOLOGY

This cross-sectional study included 150 children (69 boys and 81 girls) aged 6 to 8 years from first and second grade at the elementary school *Gjorgjija Pulevski* in Skopje, North Macedonia. Data were collected using the Children's Leisure Activities Study Survey (CLASS), a standardized and validated questionnaire completed by parents. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki for research involving human subjects (World Medical Association, 2013). Prior to data collection, written approval was obtained from the school principal, and all participants' parents or legal guardians provided written informed consent. Parents were fully informed about the purpose of the study, procedures involved, expected duration, their child's right to withdraw at any time, and the confidentiality and anonymity of all data collected. The questionnaire provided information about the children's participation in organized sports and free-time physical activity over the course of one full week (Monday to Sunday). Physical activity levels were classified according to the World Health Organization (WHO) guidelines, which recommend at least 60 minutes of moderate-to-vigorous physical activity (MVPA) per day for children. Data analysis was performed using SPSS, including descriptive statistics (mean, median, standard deviation) and nonparametric tests due to the ordinal nature of the data. Specifically, Chi-square tests were used to examine associations between gender/grade and sport participation, Mann–Whitney U tests were applied to compare activity levels between groups (boys vs. girls, 1st vs. 2nd grade), and Differences were considered statistically significant at $p < .05$.

RESULTS

As shown in Table 1, the total sample consisted of 150 children with no missing data. The average age of participants was 6.95 years ($SD = 0.82$), with a median of 7 years, indicating that the majority of children were either 6 or 7 years old. The age range was from 6 to 8 years, suggesting the sample covers early primary school ages. The gender distribution revealed that 46% of the sample

were boys (n = 69) and 54% were girls (n = 81), indicating slightly higher participation among girls. The grade distribution was also fairly balanced, with 48% of children enrolled in the 1st grade (n = 72) and 52% in the 2nd grade (n = 78).

Table 1. *Descriptives statistics (N = 150)*

	N	*Missing*	*M*	Mdn	*SD*	*R*	Min	Max
Years	150	0	6.95	7.00	0.817	2	6	8
Gender	**Counts**	**% of Total**	**Cumulative %**					
Boys	69	46.0%	46.0%					
Girls	81	54.0%	100.0%					
Grades	**Counts**	**% of Total**	**Cumulative %**					
1st	72	48.0%	48.0%					
2nd	78	52.0%	100.0%					

Note. M = Mean; Mdn = Median; SD = Standard Deviation; R=Range; Min= Minimum; Max=Maximum

Table 2. *Cross-tabulation of Sport Participation by Gender with Chi-square Test Results (N = 150)*

		Sport		
Gender		**Yes**	**No**	**Total**
Boys	Observed	49	20	69
	% within row	71.0%	29.0%	100.0%
	% of total	32.7%	13.3%	46.0%
Girls	Observed	38	43	81
	% within row	46.9%	53.1%	100.0%
	% of total	25.3%	28.7%	54.0%
Total	Observed	87	63	150
	% within row	58.0%	42.0%	100.0%
	% of total	58.0%	42.0%	100.0%

Note. $\chi^2(1, N = 150) = 8.88$, $p = .003$.

Table 2 presents the distribution of sport participation according to gender. A chi-square test of independence was conducted to examine the relationship between gender and sport participation. The results revealed a statistically significant association between gender and participation in sport activities, $\chi^2(1, N = 150) = 8.88$, $p = .003$. This suggests that boys were significantly more likely than girls to participate in sports

Table 3. *Distribution of Specific Sport Participation by Gender and Chi-square Test Results (N = 150)*

		Gender		
Which Sport?		**Boys**	**Girls**	**Total**
0.Not engaged in sports	Observed	20	43	63
	% within row	31.7%	68.3%	100.0%
1.Basketball	Observed	7	1	8
	% within row	87.5%	12.5%	100.0%
2.Football/Soccer	Observed	27	0	27
	% within row	100.0%	0.0%	100.0%
3.Volleyball	Observed	0	3	3
	% within row	0.0%	100.0%	100.0%
4.Handball	Observed	1	1	2
	% within row	50.0%	50.0%	100.0%
6.Gymnastics	Observed	0	3	3
	% within row	0.0%	100.0%	100.0%
7.Dance	Observed	0	17	17
	% within row	0.0%	100.0%	100.0%
8.Swimming	Observed	5	6	11
	% within row	45.5%	54.5%	100.0%
12.Combat sports	Observed	9	7	16
	% within row	56.3%	43.8%	100.0%
Total	Observed	69	81	150
	% within row	46.0%	54.0%	100.0%

Note. $\chi^2(8, N = 150) = 62.7$, $p < .001$.

The analysis of the association between gender and sport choice, as presented in Table 3, reveals statistically significant differences ($\chi^2(8) = 62.7$, $p < .001$). Boys were more likely to participate in sports such as football, basketball, and handball, whereas girls tended to engage more in activities like dance, swimming, and other individual sports. A considerable proportion of girls (68.3%) reported not participating in any physical activity during their free time, which is notably higher compared to boys (31.7%). These differences highlight the need to promote physical activity among children, especially among girls.

Table 4. *Distribution of Sport Participation by Grade Level with Chi-Square Test Results (N = 150)*

		Grades		
Which Sport?		**1st**	**2nd**	**Total**
0-Not engaged in sports	Observed	35	28	63
	% within row	55.6%	44.4%	100.0%
1. Basketball	Observed	2	6	8
	% within row	25.0%	75.0%	100.0%
2.Football(Soccer)	Observed	14	13	27
	% within row	51.9%	48.1%	100.0%
3. Volleyball	Observed	1	2	3
	% within row	33.3%	66.7%	100.0%
4. Handball	Observed	0	2	2
	% within row	0.0%	100.0%	100.0%
6. Gymnastics	Observed	2	1	3
	% within row	66.7%	33.3%	100.0%
7. Dance	Observed	5	12	17
	% within row	29.4%	70.6%	100.0%
8. Swimming	Observed	9	2	11
	% within row	81.8%	18.2%	100.0%
12. Combat sports	Observed	4	12	16
	% within row	25.0%	75.0%	100.0%
Total	Observed	72	78	150
	% within row	48.0%	52.0%	100.0%

Note. $\chi^2(8, N = 150) = 16.6, p = .034$.

The results of the chi-square test, as presented in Table 4, showed a statistically significant association between grade level and sport choice ($\chi^2(8) = 16.6$, $p = .034$). Although differences across most sports were not substantial, certain activities—such as dance, combat sports, and basketball—were notably more common among second-grade students. In contrast, first-grade students more frequently reported not participating in any sport or physical activity. These findings may suggest a gradual increase in sport engagement as children progress to higher grade levels.

Table 5. *Descriptive Statistics and Mann–Whitney U Test Results for Weekly Sport Participation by Gender (N = 150)*

		Statistic	***p***
Sport per week (times)	**Mann-Whitney U**	1746	<.001

Note. H_a *μ1.Boys ≠ μ2.Girls*

	Gender	***N***	**Missing**	***M***	**Mdn**	***SD***	**Min**	**Max**
Sport per week (times)	Boys	69	0	2.75	3	1.96	0	6
	Girls	81	0	1.54	0	1.69	0	5

Note. Mann–Whitney U = 1746, p < .001.

The results of the Mann–Whitney U test, as presented in Table 5, showed a statistically significant difference in sport activity frequency between boys and girls (U = 1746, $p < .001$). On average, boys participated in sports activities 2.75 times per week (*SD* = 1.96), while girls participated only 1.54 times per week (*SD* = 1.69). The median for girls was 0, indicating that many did not participate in any structured physical activity during the previous week. These results show that boys are more consistently involved in sports than girls.

Table 6. *Comparison of Weekly Sports Participation Between Grade 1 and Grade 2 Children Using the Mann-Whitney U Test (N = 150)*

		Statistic	*p*
Sport per week	**Mann-Whitney U**	2500	.220

Note. H_a $\mu 1.Boys \neq \mu 2.Girls$

	Grades	*N*	Missing	*M*	Mdn	*SD*	Min	Max
Sport per week (times)	1	72	0	1.86	1.50	1.94	0	6
	2	78	0	2.32	3.00	1.87	0	6

Note. Mann–Whitney U = 2500, p = .220.

The data presented in Table 6 show that although second-grade students exhibit a slightly higher average weekly frequency of sports activities (M = 2.32, SD = 1.87) compared to first-grade students (M = 1.86, SD = 1.94), the Mann-Whitney U test revealed no statistically significant difference between the two groups (U = 2500, p = .220). These findings suggest that the level of structured physical activity in leisure time is comparable between first and second graders.

Table 7. *Distribution of Free Time Physical Activity by Gender Among Children (N = 150)*

		Free time Activity								
Gender		**0**	**2**	**6**	**9**	**10**	**11**	**12**	**13**	**Total**
1. Boys	Observed	5	8	0	2	1	9	1	43	69
	% within row	7.2%	11.6%	0.0%	2.9%	1.4%	13.0%	1.4%	62.3%	100.0%
	% of total	3.3%	5.3%	0.0%	1.3%	0.7%	6.0%	0.7%	28.7%	46.0%
2. Girls	Observed	14	0	1	2	0	18	1	45	81
	% within row	17.3%	0.0%	1.2%	2.5%	0.0%	22.2%	1.2%	55.6%	100.0%
	% of total	9.3%	0.0%	0.7%	1.3%	0.0%	12.0%	0.7%	30.0%	54.0%
Total	Observed	19	8	1	4	1	27	2	88	150
	% within row	12.7%	5.3%	0.7%	2.7%	0.7%	18.0%	1.3%	58.7%	100.0%
	% of total	12.7%	5.3%	0.7%	2.7%	0.7%	18.0%	1.3%	58.7%	100.0%

Note: 0 = No physical activity; 1 = Basketball, 2 = Football (Soccer); 3 = Volleyball; 4 = Handball; 5 = Tennis; 6 = Gymnastics; 7 = Dance; 8 = Swimming; 9 = Cycling; 10 = Running; 11 = Playing on outdoor playgrounds; 12 = Combat sports; 13 = Mix of 2 or more activities
Note. $\chi^2(7, N = 150) = 16.5, p = .021$.

Table 7 shows a significant association between gender and free time physical activity among children ($\chi^2(7) = 16.5, p = .021$). Both boys and girls most frequently reported engaging in a mix of 2 or more activities; however, a higher percentage of girls (17.3%) reported no physical activity than boys (7.2%).

Table 8. *Distribution of Free-Time Physical Activity Types by Grade Level (1st and 2nd Grade) (N = 150)*

		Free time Activity								
Grades		**0**	**2**	**6**	**9**	**10**	**11**	**12**	**13**	**Total**
1st	Observed	4	5	1	2	0	9	1	50	72
	% within row	5.6%	6.9%	1.4%	2.8%	0.0%	12.5%	1.4%	69.4%	100.0%
	% of total	2.7%	3.3%	0.7%	1.3%	0.0%	6.0%	0.7%	33.3%	48.0%
2nd	Observed	15	3	0	2	1	18	1	38	78
	% within row	19.2%	3.8%	0.0%	2.6%	1.3%	23.1%	1.3%	48.7%	100.0%
	% of total	10.0%	2.0%	0.0%	1.3%	0.7%	12.0%	0.7%	25.3%	52.0%
Total	Observed	19	8	1	4	1	27	2	88	150
	% within row	12.7%	5.3%	0.7%	2.7%	0.7%	18.0%	1.3%	58.7%	100.0%
	% of total	12.7%	5.3%	0.7%	2.7%	0.7%	18.0%	1.3%	58.7%	100.0%

Note. $\chi^2(7, N = 150) = 13.3, p = .065$.

Table 8 shows how children from 1st and 2nd grade spend their free time in physical activities. Most children in both grades reported doing a mix of different activities (code 13), especially first graders (69.4%). Playing on outdoor playgrounds (code 11) was also common, more among second graders (23.1%). Other activities, such as cycling, running, or ball games, were less common. The difference between grades was not statistically significant ($\chi^2(7) = 13.3, p = .065$), but some differences in activity choice were observed.

Table 9. *Daily Physical Activity by Gender (Mann–Whitney U Test Results) (N = 150)*

		Statistic	*p*			
Monday	**Mann-Whitney U**	2392	.108			
Tuesday	**Mann-Whitney U**	2688	.674			
Wednesday	**Mann-Whitney U**	2441	.158			
Thursday	**Mann-Whitney U**	2455	.177			
Friday	**Mann-Whitney U**	2530	.294			
Saturday	**Mann-Whitney U**	2573	.382			
Sunday	**Mann-Whitney U**	2294	.049			
	Group	***N***	***M***	**Mdn**	***SD***	**SE**
Monday	**1. Boys**	69	1.59	2.00	1.34	0.162
	2. Girls	81	1.26	1.00	1.37	0.152
Tuesday	**1. Boys**	69	1.65	2.00	1.29	0.156
	2. Girls	81	1.56	2.00	1.41	0.156
Wednesday	**1. Boys**	69	1.62	2.00	1.33	0.160
	2. Girls	81	1.31	1.00	1.32	0.147
Thursday	**1. Boys**	69	1.80	2.00	1.29	0.155
	2. Girls	81	1.49	2.00	1.35	0.150
Friday	**1. Boys**	69	1.72	2.00	1.42	0.171
	2. Girls	81	1.52	2.00	1.33	0.148
Saturday	**1. Boys**	69	2.45	3.00	1.55	0.186
	2. Girls	81	2.31	3.00	1.39	0.155
Sunday	**1. Boys**	69	2.65	3.00	1.46	0.176
	2. Girls	81	2.12	3.00	1.54	0.171

Note. Mann–Whitney U test applied for all comparisons.

Table 9 shows the differences between boys and girls in physical activity for each day of the week. Boys had slightly higher average activity levels than girls on all days. A statistically significant difference was found only on Sunday (U = 2294, $p = .049$), when boys were more active. On other days, the differences were not significant.

Table 10. *Daily Physical Activity by Grade Level (Mann–Whitney U Test Results) (N = 150)*

		Statistic	*p*			
Monday	**Mann-Whitney U**	2187	.013			
Tuesday	**Mann-Whitney U**	2109	.006			
Wednesday	**Mann-Whitney U**	2252	.027			
Thursday	**Mann-Whitney U**	2118	.006			
Friday	**Mann-Whitney U**	2279	.036			
Saturday	**Mann-Whitney U**	2554	.317			
Sunday	**Mann-Whitney U**	2588	.389			
	Grades	***N***	***M***	**Mdn**	***SD***	**SE**
Monday	**1st**	72	1.68	2.00	1.34	0.158
	2nd	78	1.17	0.500	1.34	0.152
Tuesday	**1st**	72	1.93	2.00	1.18	0.139
	2nd	78	1.29	0.500	1.43	0.162
Wednesday	**1st**	72	1.69	2.00	1.31	0.154
	2nd	78	1.23	1.000	1.32	0.149
Thursday	**1st**	72	1.99	2.00	1.14	0.135
	2nd	78	1.31	0.500	1.41	0.159
Friday	**1st**	72	1.86	2.00	1.32	0.156
	2nd	78	1.38	1.000	1.39	0.157
Saturday	**1st**	72	2.29	3.00	1.32	0.155
	2nd	78	2.45	3.000	1.59	0.180
Sunday	**1st**	72	2.29	3.00	1.36	0.160
	2nd	78	2.44	3.000	1.66	0.188

Note. Mann–Whitney U test applied for all comparisons.

Table 10 shows that 1st-grade students were more physically active than 2nd-grade students on weekdays. Statistically significant differences were observed from Monday to Friday ($p < .05$). No significant differences were observed on the weekend (Saturday and Sunday), during which both grades had similar activity levels.

DISCUSSION

The findings of this study provide valuable insight into the physical activity patterns of children aged 6 to 8 years in North Macedonia. The results showed statistically significant gender differences in both sport participation and free-time physical activity. Boys were more likely to engage in structured sport activities ($\chi^2(1) = 8.88$, $p = .003$) and had a significantly higher weekly frequency of sport participation than girls ($M = 2.75$ vs. 1.54; $p < .001$). This aligns with previous research indicating that boys are generally more active and more frequently involved in organized sports compared to girls (Janssen & LeBlanc, 2010; Strong et al., 2005). Moreover, the study revealed distinct gender-based sport preferences, with boys favoring football and basketball, and girls showing greater interest in dance, swimming, and gymnastics. These patterns are consistent with gendered social norms and preferences observed in earlier studies (Poitras et al., 2016). Alarmingly, 68.3% of girls reported no participation in sports, compared to only 31.7% of boys, emphasizing a need for targeted interventions to promote physical activity among girls. Grade-level comparisons also yielded meaningful findings. Second-grade students were more involved in sports such as basketball, dance, and combat sports, whereas first-graders more frequently reported no participation or preferred activities like swimming and outdoor play. The association between grade level and sport choice was statistically significant ($\chi^2(8) = 16.6$, $p = .034$), suggesting that as children progress through school, they may become more engaged in structured physical activity. Analysis of daily physical activity patterns showed that boys were slightly more active than girls on all days, with a significant difference observed only on Sunday ($p = .049$). However, when comparing by grade, first-grade students were more active during weekdays, with significant differences from Monday to Friday ($p < .05$). This could reflect differing academic schedules, maturity, or social influences that shift with age. Although this study did not measure the exact duration of physical activity in minutes, the reported frequency of sport and free-time activity suggests that many children—particularly girls—may not be sufficiently active on a weekly basis. These findings align with global concerns regarding low activity levels in childhood and early adolescence. Previous research has shown that fewer than 40% of children worldwide meet physical activity recommendations (Aubert et al., 2018; Guthold et al., 2020), highlighting the importance of encouraging regular participation in physical activities—especially among less active groups such as girls.

Environmental and social factors play a critical role in shaping children's physical activity habits. Access to sports facilities and green spaces is essential for encouraging regular physical activity and supporting overall well-being (Stefanovska Cvetkovska, 2024). This underscores the importance of public health campaigns and parental involvement in promoting outdoor play and reducing sedentary behaviors, especially during weekends when children typically have more free time. Moreover, access to sports facilities is pivotal in fostering physical activity, social inclusion, and community well-being (Stefanovska Cvetkovska, 2024).

CONCLUSION

This study highlights significant gender and grade-level differences in physical activity among early school-aged children in North Macedonia. Boys were generally more active and more likely to participate in organized sports, while girls reported lower activity levels and higher non-participation rates. These differences call for the development of gender-sensitive and age-appropriate interventions that promote physical activity among all children. To foster lifelong healthy habits, schools and policymakers should focus on creating inclusive, enjoyable, and accessible physical activity opportunities—particularly for girls and younger students. Future research should include a broader geographic sample, examine psychosocial and environmental factors, and use objective measures, such as accelerometry, for deeper analysis.

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