

PARTICIPATING IN KINESIOLOGY ACTIVITIES IN PRIMARY EDUCATION STUDENTS' FREE TIME

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Abstract: The objective of the research was to investigate to what extent students of first and second grades of primary school participate in physical activities in their free time. We are living in the age of sedentary lifestyle, which is becoming a problem of public health. 189 respondents took part in this research of which 93 girls and 96 boys aged 7 to 9. To assess the level of students' activity in their free time, a poll was used consisting of eight questions from the questionnaire "Fels physical activity questionnaire for children" (FPAQ). Based on queries from the questionnaire, indices were calculated from the area of sports (IS), free time (ISV; household chores (IKP) and total physical activity result (UTA). To assess body composition, anthropometric measures of height, mass, BMI and percentage of fat in the body were used. To assess those, we used the device for measuring physical composition – Omron BF500 Body Composition Monitor. Results indicate that 59.26% do not meet daily recommendations for participating in physical activities. As regards the difference in students' age, it is notable that second grade students are somewhat more physically active. Observing average results, it is clear that students were most physically active in their free time. The lowest values were recorded in the area of sports at school, (1.15), yet lower values were also obtained from sports club activities (2.06). It is evident that students of that age are minimally active during their PE classes and this is a segment where the number of physically active students can be increased. Increasing physical activity at school shall encourage students to participate in physical activity outside educational institutions.

Key words: obesity, free time, school, physical activity, students

INTRODUCTION

World Health Organization (WHO, 2010) recommends that all young people aged 5 to 17 should participate in at least 60 minutes of moderate to intense physical activity every day, i.e. above three MET. One subjective way of assessing the intensity of physical activity is the metabolic equivalent of task (MET), also defined as the ratio between energy expenditure and rate of rest (Perez-Soto et al., 2018). Time spent in physical activity has great repercussions for the future health of children and youth. Insufficient physical activity in children and youth negatively affects the development of their abilities, skills and knowledge, as well as health status (Badrić and Ravlić, 2017). In recent years, promoting physical activity in adults and children has become important for social activities as well. Current policies and strategies for increasing physical activity with children have been promoting a multicomponent approach with various intervention aspects in different surroundings (Payne, Townsend and Foster, 2013). A healthy lifestyle learned from the earliest childhood remains present to adulthood (Karnik and Kanekar, 2012). Regular physical activity is the only acquired habit aiding in reducing the risk of obesity (Simon et al., 2014). Nowadays, young people tend to choose activities which do not require any physical effort at all, and due to latest technological achievements spend their time using a wide range of passive content. Using such passive content is detrimental, primarily for the health of a young person from his or her early days and neglecting a whole series of abilities which simply cannot be developed when participating in said activities (Badrić and Prskalo, 2011). Sadly, nowadays one is not able to independently create their free time, and global communication services act aggressively towards their consumers, overwhelming them with irrelevant information and thus alienating from independently organizing their free time, placing a person in a passive state (Badrić, Prskalo and Matijević, 2015). Among school obligations, work and leisure, children do have some free time, which, without proper guidance, is often misused. The school system does not provide enough physical activity through classes, which is why it is necessary for a child to participate in an organized or independent physical activity so as to reach the level required for health sustainability. (Badrić, 2011).

The objective of the research was to investigate to what extent students of first and second grades of primary school participate in physical activities in their free time and whether there are any differences as regards sex and age.

METHODS

189 respondents took part in this research of which 93 girls and 96 boys aged 7 to 9. Respondent sample included students from three primary school from the town of Petrinja. All students were in perfect health at the time the research was carried out. All parents gave their written consent for students participating in the research. Measuring was conducted from the 28th of April to the 31st of May 2019. All research procedures were conducted within the scope of regular PE classes. Physical activity level was assessed using Fels physical activity questionnaire for children (Fels PAQ for children, Treuth, Hou, Young and Maynard, 2005), a standardized questionnaire used to assess the level of physical activity with children and teenagers aged 7 to 19. Physical activity level of a person is determined through three types of activities, namely sports, free time and household chores, thus assessing the total physical activity level. The sample of morphological variables comprised anthropometric measurements of height and mass. Height was measured using the anthropometer. The researched utilized a device for measuring bodily composition – Omron BF500 Body Composition Monitor. This is an instrument which determined the percentage of fat tissue via bioelectric impedance. It was used to measure body mass, body mass index and the percentage of fat in the body.

All variables had central and dispersive elements calculated: arithmetic mean (X), standard deviation (SD), minimum result (MIN), maximum result (MAX). Variable distribution normality was tested via the Kolmogorov-Smirnov test (K-S test). Differences in physical activity between students according to sex and age was determined using the Mann-Whitney U test. Statistical relevance was tested on the level of $p < .05$. Data processing was conducted using the programme STATISTICA version 13.4.0.14., TIBCO Software Inc.

RESULTS

Table 1. Values of total level of physical activity for boys and girls in 1st and 2nd grades on a Likert scale

	Physical activity level %				
	1	2	3	4	5
total	0,53	1,06	57,67	37,04	3,70
boys		2,08	50,00	40,63	7,29
girls	1,08	0	65,59	33,33	0

(Treuth et al., 2005), 1, 2 and 3 insufficient physical activity level, 4 and 5 recommended physical activity level

Table 1 shows that the total level of physical activity for the subsample defined by sex did not meet the recommendations for (Treuth et al., 2005) participating physical activity. The total of 59.26% students do not meet the recommendations, and when observing results according to sex, 47.92% of boys meet the recommendation in relation to only 33.33% of girls. It should be emphasized that of the total percentage of girls, not one had the highest value of total physical activity.

Table 2. Values of total level of physical activity for boys and girls per grade on a Likert scale

Grade	Physical activity level %				
	1	2	3	4	5
1	1,16		60,47	32,56	4,65
2	0	0,97	55,34	40,78	2,91

(Treuth et al., 2005), 1, 2 and 3 insufficient physical activity level, 4 and 5 recommended physical activity level

Values in table 2 show the ratio of students of the defined subsample according to grade. It is clear that second-grade students are somewhat more active: 43.69% in relation to 37.21% of first-grade students.

Table 3. Descriptive indicators of morphological characteristics and variables of the questionnaire on the level of physical activity for the total number of respondents.

	N	AS	SD	Min	Max	K-S
Sports at school	189	1,15	0,36	1,00	2,00	$p < ,01$
Sports club	189	2,06	0,92	1,00	5,00	$p < ,01$

Perspiration during activity	189	2,42	1,99	0,00	5,00	p < ,01
Sports in free time	189	3,79	1,27	0,00	5,00	p < ,01
Sedentary in free time	189	2,70	1,15	1,00	5,00	p < ,01
Walking/cycling to school	189	3,01	1,60	0,00	5,00	p < ,01
Household chores	189	2,72	1,01	1,00	5,00	p < ,01
Perspiration during household chores	188	2,14	1,47	0,00	5,00	p < ,01

N= number of respondents; *AS*= arithmetic mean; *SD*= standard deviation; *MIN*= minimum result; *MAX*= maximum result; *K-S*=Kolmogorov-Smirnov normality test

The result of Kolmogorov-Smirnov test ($KS=p < 0,01$) demonstrated that the distribution of questionnaire variable results as regards the level of physical activity differs from normal distribution in a statistically relevant level. Observing average results, it is clear that students were most physically active in their free time. They usually walk or cycle to school. The lowest values are recorded in the area of sports at school, (1.15), yet lower values were also obtained from sports club activities (2.06). Increased physical activity was also noticed when doing household chores (2.72).

Table 4. Descriptive indicators of physical activity index for boys and girls – total sample

	N	AS	SD	Min	Max	K-S
Sport index	189	1,87	0,91	0,67	4,00	p < ,01
Free time index	189	3,40	1,00	0,00	5,00	p < ,01
Household chores index	189	2,43	0,97	0,50	5,00	p < ,01
Total physical activity	189	7,70	1,92	1,17	12,83	p < ,20

N= number of respondents; *AS*= arithmetic mean; *SD*= standard deviation; *MIN*= minimum result; *MAX*= maximum result; *K-S*=Kolmogorov-Smirnov normality test

Table 4 shows average values of physical activity index. Students are most active in their free time, when doing household chores and then during sports activities. Total physical activity averages UTA=7.70. This average result of total physical activity for girls does not enter the framework of recommended physical activity (according to Treuth et al., 2005), which is why it is safe to conclude that this sample of first- and second-grade students is on average insufficiently physically active.

Table 5. Differences in variables for assessing physical activity between boys and girls obtained by Mann – Whitney test

	Boys	Girls	M-W test
	96	93	
	AS±SD	AS±SD	
Height	133,22±7,29	131,83±7,41	0,22
Mass	31,65±7,72	30,28±8,04	0,08
Body mass index (BMI)	17,89±3,21	17,50±3,43	0,19
Percentage of fat	20,39±7,20	19,78±8,38	0,38
Sports at school	1,15±0,35	1,15±0,36	0,96
Sports club	2,22±1,01	1,89±0,79	0,02*
Perspiration during activity	2,78±2,17	2,04±1,73	0,02*
Sports in free time	3,95±1,19	3,62±1,33	0,13
Sedentary in free time	2,60±1,29	2,80±1,00	0,27
Walking/cycling to school	3,05±1,59	2,96±1,61	0,69
Household chores	2,68±1,07	2,76±0,95	0,34
Perspiration during household chores	2,30±1,63	1,98±1,28	0,35

* statistical relevance level $p < 0.05$; *AS*= arithmetic mean; *SD*= standard deviation;

Results shown in table 5 present the comparison of respondents according to sex. Boys are nominally somewhat taller (133,22±7,29) and have greater body mass (31,65±7,72) than girls, which is in line with referent values on the

level of the Republic of Croatia (Jureša et al., 2011). Furthermore, the values of body mass index are also in line with the referent values of that research. A non-parametric Mann-Whitney U-test was used to determine the differences. Statistically relevant differences were noticed in variables estimating participating in sports clubs and during sports activities, where boys ($p=0.02$) are significantly more included in the segment than girls. In variables assessing free time and household chores no statistically significant differences have been determined.

Table 6. Differences in physical activity between boys and girls obtained by Mann – Whitney test

	Boys	Girls	
	96	93	
	AS±SD	AS±SD	M-W test
Sport index	2,05±1,00	1,70±0,78	0,00*
Free time index	3,50±0,99	3,29±1,01	0,12
Household chores index	2,49±1,06	2,36±0,85	0,54
Total physical activity	8,04±2,13	7,35±1,62	0,02*

* statistical relevance level $p<0.05$; AS= arithmetic mean; SD= standard deviation;

Results of differences in physical activity between students of defined subsamples according to sex are shown in table 6. Boys are statistically more relevantly physically more active in the area of sports and total physical activity. Studied subsamples in the areas of free time and household chores do not differ significantly and their values are nominally on the same level.

Table 7. Differences in variables for assessing physical activity and morphological variables between students according to grade obtained by Mann – Whitney test

	1st grade	2nd grade	
	86	103	
	AS±SD	AS±SD	M-W test
Height	128,66±6,15	135,77±6,73	0,00*
Mass	28,62±5,45	32,94±9,02	0,00*
Body mass index (BMI)	17,39±2,74	17,96±3,73	0,66
Percentage of fat	20,16±6,62	20,03±8,67	0,58
Sports at school	1,14±0,35	1,16±0,36	0,76
Sports club	2,08±0,94	2,04±0,91	0,89
Perspiration during activity	2,31±1,97	2,50±2,02	0,64
Sports in free time	3,85±1,37	3,74±1,19	0,31
Sedentary in free time	2,40±1,19	2,95±1,06	0,00*
Walking/cycling to school	2,94±1,65	3,06±1,56	0,63
Household chores	2,64±0,94	2,79±1,06	0,38
Perspiration during household chores	2,10±1,53	2,18±1,43	0,56

* statistical relevance level $p<0.05$; AS= arithmetic mean; SD= standard deviation;

Results presented in table 7 show that there are statistically relevant differences according to respondents' ages. Second-grade students are significantly taller ($p=0,00$) and their body mass is bigger ($p=0,00$), which is to be expected in line with the development of human organism, as they are older. Also, the non-parametric Mann-Whitney U-test has shown that there are statistically significant differences in the variable assessing to what extent children are sedentary in their free time. It is evident that second-grade students spend much more time sitting than their first-grade peers. ($p=0,00$).

Table 8. Differences in physical activity according to grade obtained by Mann – Whitney test

	1st grade	2nd grade	
	86	103	
	AS±SD	AS±SD	M-W test
Sport index	1,84±0,92	1,90±0,91	0,55
Free time index	3,40±1,05	3,40±0,97	0,83
Household chores index	2,37±0,93	2,47±1,00	0,63
Total physical activity	7,61±2,00	7,77±1,87	0,45

AS= arithmetic mean; SD= standard deviation

Results of differences in physical activity between students of defined subsamples according to age are shown in table 6. Studied subsamples in the areas of sports, free time, household chores and total physical activity do not differ statistically and their values are nominally on the same level.

DISCUSSION

When observing the results assessing the total physical activity of students, it is evident that almost 59% of the sample of first and second grade students fail to meet the recommendations according to Treuth et al. (2005). Moreover, 52% of boys and 67% of girls are not physically active, which is alarming considering the state of health in the population of children and youth. Research carried out by Kunješić (2015) obtained similar results, concluding that most children do not participate in physical activity in recommended daily dosage. Data obtained by research (Currie et al., 2012) conducted in 2009/2010, shows devastating results with a high percentage of insufficiently physically active children. Research by Badrić and Ravlić (2017), obtained higher results, i.e. that 84% of students have a moderate level of physical activity, in line with borderline values as regards meeting daily requirements for physical activity. Another research (Karakas et al. 2014), obtained significantly higher results, confirming that studied children are indeed physically active. Vidaković Samaržija and Mišigoj-Duraković (2016) established that almost 46% of boys and 30% of girls do meet recommended daily needs in terms of physical activity. Kovač et al. (2013) have reached the conclusion that most children meet the recommended values of at least 60 minutes of moderate and high-intensity physical activity per day.

Looking at obtained indices for assessing physical activity, it has been noted that studied students are most active in their free time, confirmed by Kunješić's research (2015). Furthermore, research results (Troiano, Berrigan, Dodd, Tilert, and McDowell 2008) indicate a higher level of physical activity with boys, while Vidaković Samaržija and Mišigoj-Duraković (2016) conclude that boys are more interested in sports than girls, hence more physically active in their free time. Jureša, Musil, Majer and Petrović (2010) obtained similar results in their research, adding that girls are more active than boy sin their free time. Moderate and high-intensity physical activity in free time provides a significant contribution to general health (Ischander et al., 2007).

The lowest values of physical activity are visible in the area of school sports (1.15), but lower values are also recorded for sports club activities (2.06). Increased physical activity is seen in doing household chores (2.72). Opposed to results obtained in this research, Kunješić's research (2015) shows both boys and girls have low values in doing household chores, and somewhat higher in the areas of school sports and sports clubs. Sulema Smolensky and Lai, (2006) as well as Swaminathan, Selvam, Thomas, Kurpad and Vaz (2011) point at low results in school sports, especially in the population of girls. Drop and low values as regards school sports are also confirmed bb research carried out by Sigmund et al. (2012).

Total physical activity averages UTA=7.70. This average result of total physical activity for girls fails to enter the normative framework of recommended physical activity (according to Treuth et al., 2005) and so it can be stated that this sample of first- and second-grade primary school students is on average insufficiently physically active. Kunješić's research (2015) had a bit higher index of total physical activity, yet still far from maximum value of total physical activity.

Physical activity at school has been reducing significantly, what due to the many hours spent sitting, what due to too much homework and studying requiring a specific time spent sitting at home (Petrić, 2011). Children spend most of their day sitting (National Heart Foundation of Australia, 2011) and it would be ideal if we could establish a balance between time spent doing physical activity and time spent sitting. Furthermore, teenage boys do more sports than girls (Guerra et al. 2006), also recorded in research carried out by Badrić and Ravlić (2017).

Differences between the two sexes only occur in the sports variable, in line with previous research, while other research segments showed no significant differences.

As regards differences in terms of age, second-grade students had statistically more significant results in morphological measures of height and body mass. Also, one statistically relevant difference occurred in the variable assessing sedentary behaviour in free time, leading to the conclusion that older students are more prone to sedentary activities than younger students. This fact proves that the negative trend of sedentary lifestyle increases with age.

CONCLUSION

All previous research, as well as future research into this phenomenon of physical activity with children and youth point at the negative trend in participating in daily physical activity. Insufficient quantity of physical activity in this population is becoming a more and more prominent problem of public health. Physical activity of children in primary education must be primarily directed at the continued implementation of PE classes. It is evident that there is only a minimum of activity of students of that age in PE classes, which is why this segment needs to be the area where we should seek the increase in the number of physically active students. The need for physical activity should be developed from the earliest age. Increase in physical activity at school shall encourage student to participate in physical activity outside educational institutions.

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UČESTVOVANJE U KINEZIOLOŠKIM AKTIVNOSTIMA U SLOBODNO VRIJEME UČENIKA OSNOVNOŠKOLSKOG UZRASTA

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Apstrakt: Cilj istraživanja bio je istražiti u kojoj mjeri učenici prvih i drugih razreda osnovne škole u slobodno vrijeme učestvuju u fizičkim aktivnostima. Živimo u vrijeme sjedilačkog načina života, koji postaje problem javnog zdravlja. U ovom istraživanju učestvovalo je 189 ispitanika, od čega 93 djevojčice i 96 dječaka, uzrasta od 7 do 9 godina. Za procjenu nivoa aktivnosti učenika u njihovom slobodnom vremenu korištena je anketa koja se sastojala od osam pitanja iz upitnika „Osjećajni upitnik fizičke aktivnosti za djecu” (FPAQ). Na temelju pitanja iz upitnika izračunati su indeksi iz područja sporta (IS), slobodnog vremena (ISV), kućnih poslova (IKP) i ukupnog rezultata fizičke aktivnosti (UTA). Da bi se procijenio sastav tijela, antropometrijske mjere visine, težine, BMI i postotak masti u tijelu, korišten je uređaj za mjerenje fizičkog sastava - Omron BF500 Monitor tijela. Rezultati pokazuju da 59,26% ne ispunjava dnevne preporuke za učestvovanje u fizičkim aktivnostima. Što se tiče razlike u uzrastu učenika, primjetno je da su učenici drugog razreda malo fizički aktivniji. Posmatrajući prosječne rezultate, jasno je da su učenici bili najviše fizički aktivni u slobodno vrijeme. Najniže vrijednosti zabilježene su u području sporta u školi (1,15), dok su niže vrijednosti zabilježene i iz aktivnosti sportskih klubova (2,06). Očigledno je da su učenici tog uzrasta minimalno aktivni tokom nastave fizičkog vaspitanja i to je segment u kojem se broj fizički aktivnih učenika može povećati. Povećavanje fizičke aktivnosti u školi će podstaći učenike i na učestvovanje u fizičkim aktivnostima van obrazovnih ustanova.

Ključne riječi: gojaznost, slobodno vrijeme, škola, fizička aktivnost, učenici