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LEVEL, TYPES, AND BARRIERS TO PHYSICAL ACTIVITY OF 13- TO 14-YEAR-OLD CHILDREN

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SUMMARY

Physical activity has significant health benefits in young people, but many do not meet established guidelines to improve physical activity levels, which is a significant health concern. More research on potential barriers to youth physical activity participation is required to raise awareness of young people's physical activity. Based on that, the main objective of this study was to analyze the engagement of senior elementary school students in physical activities, depending on gender. In addition, factors that could be potential barriers to preventing students from participating in physical activities will be analyzed. It is assumed that there are significant differences between boys and girls aged 13 and 14 in terms of their participation in physical activities. The sample consisted of a total of 721 subjects with an average age of 14.3 ± 0.7, of which 372 were boys and 349 were girls. For the purposes of this research, a survey questionnaire (Mitić et al., 2010) was used, which contains a total of 17 questions, divided into three groups. For statistical processing, non-parametric tests, the Chi-square test (χ^2), were used to examine the significance of the difference. The Chi-square test (χ^2) was used to evaluate the match between the observed and theoretical frequencies in each group and measure the significance of the difference between them. The Chi-square test of independence was used to compare the differences between the male and female groups. The results of the χ^2 test of independence showed that there is a statistically significant difference between boys and girls in the frequency of exercise ($p \leq 0.01$). The results of the χ^2 test showed that there are no statistically significant differences between the groups of boys and girls in the choice of place and method of exercise (Sig. > .05). The results showed that both boys and girls have barriers to practicing physical activities, but that they do not differ significantly. This study showed that there are significant differences between boys and girls regarding the frequency of participation in physical activities. Recently, research activities in this area have increased significantly.

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However, there is not enough good quality research on evaluations and effectiveness of interventions, strategies for overcoming barriers to participation in physical activities, as well as on promoting physical activity for socially disadvantaged groups of children.

Key words: boys, girls, physical activity, barriers

INTRODUCTION

Physical activity (PA) is any activity that involves the use of one or a group of muscles that results in energy expenditure.[1] Children and adolescents should engage in physical activity of moderate to high intensity for 60 minutes per day, according to the recommendations of the world's competent public health institutions. High-intensity aerobic activities as well as exercises to strengthen muscles and bones should be used at least three times per week.[2] These activities should be in accordance with the age characteristics of the children, should include different types of activities and above all should be enjoyable for the children. These guidelines exist in the USA, Australia and all member countries of the European Union. Children and young people can benefit greatly from regular physical activity aimed to at enhancing their health.

Despite all the advantages offered by PA, many national and international studies have shown that a high percentage of children and young people do not meet the given recommendations. Boys are generally more physically active than girls at every age.[3] When compared to girls, boys aged 12 to 15 engaged in moderate-intensity physical exercise for an average of 12.7 more minutes each day, and participation in moderate to vigorous physical activity declines with age, while older children are less likely to complete 60 minutes of moderate to vigorous physical activity per day than younger children.[4,5] Walker, Craig,

[1] Caspersen, Carl J., Kenneth E. Powell, and Gregory M. Christenson. "Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research." *Public health reports* 100.2 (1985): 126.

[2] World Health Organization. "*WHO guidelines on physical activity and sedentary behaviour: web annex: evidence profiles.*" (2020).

[3] Rosselli, Martina, et al. "Gender differences in barriers to physical activity among adolescents." *Nutrition, Metabolism and Cardiovascular Diseases* 30.9 (2020): 1582-1589.

[4] Borraccino, A. L. B. E. R. T. O., et al. "Socioeconomic effects on meeting physical activity guidelines." *Med Sci Sport Exerc* 41 (2009): 749-56.

[5] Baran, Joanna, et al. "60 Minutes Per Day in Moderate to Vigorous Physical Activity as a Natural Health Protector in Young Population." *International Journal of Environmental Research and Public Health* 17.23 (2020): 8918.

Pavlovic, Thiele, Natale, et al. (2021) report that school-based health education programs have the potential to slow age-related declines in physical activity and can help students establish lifelong healthy physical activity patterns.[6] In addition, a study conducted in Greece showed that childhood diseases and early death can be prevented by promoting healthy habits early in life. Nelson, Benson and Jensen (2010) found that the significant effects of insufficient physical activity in childhood and adolescence can be seen throughout life. This study further reveals that the most common risks of those mentioned are the risk of obesity and other related physical and mental illnesses.[7]

The importance of physical education in schools is significant in encouraging regular physical activity, which supports the promotion of a healthy lifestyle in later years of life.[8] Engaging students in physical activities at an early stage not only affects physical appearance, but also develops a positive attitude towards these activities. It is evident that students who show more positive attitudes towards PA in the institution also participate in it and outside the institution.[9] One study suggests that a positive attitude toward exercise may be a primary determinant of a physically active lifestyle.[10] The lack of parental supervision is viewed by parents as a risk concern for children and, as a result, as a factor limiting children's ability to engage in physical exercise, according to research on how children use urban area for physical activity. In previous studies, the lack of appropriate, inexpensive, and accessible physical activity facilities was frequently cited as a hindrance. Women-only physical exercise facilities were necessary for sociocultural reasons, however it was noted that many of these were expensive to join and far from homes.[11]

Physical activity has significant health benefits among young people, but many do not meet established recommendations to improve physical activity levels,

[6] Walker, Timothy J., et al. "Physical Activity and Healthy Eating Programming in Schools to Support Student's Health-Related Fitness: An Observational Study." *International Journal of Environmental Research and Public Health* 18.21 (2021): 11069.

[7] Nelson, Timothy D., Eric R. Benson, and Chad D. Jensen. "Negative attitudes toward physical activity: Measurement and role in predicting physical activity levels among preadolescents." *Journal of pediatric psychology* 35.1 (2010): 89-98.

[8] Lee, Jung Eun, Zachary Pope, and Zan Gao. "The role of youth sports in promoting children's physical activity and preventing pediatric obesity: a systematic review." *Behavioral Medicine* 44.1 (2018): 62-76.

[9] Hutmacher, Djenna, et al. "Does motivation in physical education have an impact on out-of-school physical activity over time? A longitudinal approach." International Journal of Environmental Research and Public Health 17.19 (2020): 7258.

[10] Ibid.

[11] Burton, Nicola W., Bonnie L. Barber, and Asaduzzaman Khan. "A qualitative study of barriers and enablers of physical activity among female Emirati university students." *International Journal of Environmental Research and Public Health* 18.7 (2021): 3380.

which is a significant health challenge.[12] In order to develop awareness of youth physical activity, more research needs to be conducted regarding possible barriers to youth participation in physical activity. Based on that, the primary goal of this research was to analyze the engagement of senior elementary school students in physical activities, depending on gender. In addition, factors that could be potential barriers to preventing students from participating in physical activities will be analyzed. It is assumed that there are significant differences between boys and girls aged 13 and 14 in terms of their participation in physical activities.

RESEARCH METHODS

The sample of subjects

The sample of respondents consisted of a total of 721 respondents with an average age of 14.3 ± 0.7, of which 372 were boys and 349 were girls (Table 1). All participants were randomly selected from 5 schools in Niš, and the condition for participation in the research was that they were in the 7th and 8th grade of elementary school and aged 13 and 14. After giving their consent, the participants were questioned about their health status. Before starting to fill out the questionnaire, the participants were informed about the research procedure, and parental permission was required for participation in the research.

Table 1. The Sample of Subjects

School	N	Boys	Girls
Bubanjski heroji	192	99	93
Mika Antic	166	86	80
Dositej Obradovic	173	92	81
Vozd Karadjordje	112	55	57
Car Konstantin	78	40	38

[12] Tremblay, Mark S., et al. "Physical activity of children: a global matrix of grades comparing 15 countries." *Journal of physical activity and health* 11.s1 (2014): S113-S125.

Sample of Measuring Instruments

A questionnaire with a total of 17 questions, conditionally divided into three groups, was used for this study.13 The first group of questions is defined as 1) Frequency, type and place of activity, and is presented in the questionnaire with 4 items. 2) The second group of questions included 4 items, and this group of questions was defined as a way of practicing. 3) The third group of questions consisted of a total of 9 items, and this group of questions was defined as Barriers to the implementation of physical activities. All items were of the closed selective type, and the questions were clearly and precisely composed in a specific order. A three- and four-point Likert-type scale was used in this research.

Statistical data processing

Basic descriptive parameters were calculated for each group by calculating frequencies and percentages. For statistical processing, non-parametric tests were used to examine the significance of the difference, the Chi-square test (χ^2). To test the significance of the difference between observed and theoretical frequencies in each group, the Chi-square test (χ^2) was applied to assess the quality of the match. To determine the differences between the groups of men and women, the Chi-square test (χ^2) of independence was applied. The significance level was set at 0.05. The data were processed using a statistical package for the social sciences (SPSS) (Version 18.0) (Chicago, IL, USA).

RESULTS

Table 2 shows the obtained frequencies, percentage values, Chi-square test (χ^2) for examining the quality of matching for each group individually and Chi-square test (χ^2) of independence between groups for the group of questions defined as Frequency, type and place of activity.

[13] Mitić, D., et al. "Angažovanost u rekreaciji građana Republike Srbije: istraživanje obavljeno za potrebe Ministarstva omladine i sporta Republike Srbije." *Beograd: Fakultet sporta i fizičkog vaspitanja, Univerzitet u Beogradu i Ministarstvo omladine i sporta* (2010).

Table 2. Frequency, type and place of activity

Question		Boys (372)		Girls (349)		Boys vs girls	
	Answer	**Frq (%)**	χ^2	**Frq (%)**	χ^2	χ^2	**Sig.**
How often do you do PA in your free time?	never	29(7.8)	141.42**	50(14.3)	44.96**	15.56	.001**
	sometimes	113(30.4)		92(26.4)			
	1-2/week	53(14.2)		72(20.6)			
	2-4/week	177(47.6)		135(38.7)			
Did you and how many times in the last year did you go on a field trip in your area with your school?	never	169(45,4)	429,23**	152(43,6)%	245,07**	1,41	,842
	≤ 5	175(47,0)		168(48,1)			
	6-10	19(5,1)		21(6,0)			
	>11 times	9(2,5)		8 (2,3)			
Have you and your parents gone on an excursion in your area in the last year and how many times?	never	113(30,4)	103,46**	90(25,8)	101,16**	2,31	,510
	≤ 5	164(44,1)		163(46,7)			
	6-10	52(14,0)		48(13,8)			
				48(13,8)			
	>11 times	43(11,6)					
Did you and how many times in the last year did you go to a picnic spot in your area with your friends?	never	135(36,3)	143,31**	130(47,6)	70,49**	10,56	,014**
	≤ 5	163(43,8)		122(30,4)			
	6-10	51(13,7)		56(14,2)			
				41(7,8)			
	>11 times	23(6,2)					

Legend: *Frq. - frequencies - number of subjects*, χ^2 *- Chi-square test*, ** *- level of significance p< .01 inside groups*, *Sig - test between groups*

By analyzing the obtained frequencies for the stated statements, and the results of the χ^2 of the match quality test, it can be seen that most of the values, whether for boys or girls, deviate from the expected hypothetical values, and that a statistically significant difference at the level of significance was found for all questions .01. (**). Based on the obtained frequencies (Frq), it can be stated that a large number of children exercise regularly (47.6% of boys and 38.7% of girls), and occasionally (30.4% of boys and 26.4% of girls). A large number of boys and girls never went on a trip in their region once or less than five times (Table 2). The results of the χ^2 test of independence showed that there is a statistically significant difference between boys and girls in the frequency of exercise ($p \leq 0.01$). A statistically significant difference was also found between boys and girls in going to a nearby picnic spot with friends at the .05 level.

Table 3. Type of activity

		Boys (372)		Girls (349)		Boys vs Girls	
Statement	**Answer**	**Frq (%)**	χ^2	**Frq (%)**	χ^2	χ^2	**Sig.**
In my free time, I do PA with my friends by running, playing soccer, basketball...	never	58(15,6)		68(19,5)			
	sometimes	204(54,8)	88,32**	200(57,3)	90,98**	4,507	,105
	frequently	110(29,6)		81(23,2)			
In my free time, I do PA by going to some of the sports centers	never	173(46,5)		187(53,6)			
	sometimes	136(36,6)	50,53**	103(29,5)	245,07**	4,503	,105
	frequently	63(16,9)		59(16,9)			
In my free time, I do PA by having my own independent program that I run	never	169(45,4)		169(48,4)			
	sometimes	135(36,3)	42,59**	116(33,2)	47,38**	,827	,661
	frequently	68(18,3)		64(18,3)			
In my free time, I do PA in a sports club	never	128(34,4)		138(39,5)			
	sometimes	87(23,4)	148,75**	90(25,8)	10,18**	5,401	,145
	frequently	157(42,2)		121(34,7)			

Legend: *Frq. - frequencies - number of subjects*, *χ^2 - Chi-square test*, *** - level of significance p< .01 inside groups*, *Sig - test between groups*, *PA- physical activity*

By analyzing the obtained frequencies for the stated statements, and the χ^2 values of the match quality test, it can be seen that most of the values, whether for boys or girls, deviate from the expected hypothetical values, and that a statistically significant difference was found at .01. (**) for all questions. Based on the obtained frequencies (Frq), it can be stated that a large number of boys (54.8%) and girls (57.3%) decide to participate in physical activities with friends during their free time. When we talk about the method of exercise and the location of physical activities, a very small number of children visit a sports center (16.9% of boys and 16.9% of girls). The results of the χ^2 test showed that there are no statistically significant differences between the groups of boys and girls in the choice of place and method of exercise (Sig. > .05) (Table 3).

Table 4. Barriers to the implementation of physical activities

		Boys (346)		**Girls (266)**		**boys vs girls**	
Statement	**Rating**	**Frq (%)**	**χ^2**	**Frq (%)**	**χ^2**	**χ^2**	**Sig.**
I don't feel the	yes	99	10,50**	75	36,48**	4,36	,11

need		(26,6)		(21,5)		5	3
	partially	123 (33,1)		108 (30,9)			
	no	150 (40,3)		166 (47,6)			
Lack of habits	yes	87 (23,4)		76 (21,8)			
	partially	130 (34,9)	19,08**	143 (41,0)	21,70**	2,824	,244
	no	155 (41,7)		130 (37,2)			
Age bothers me	yes	17 (4,6)		13(3,7)			
	partially	59(15,9)	364,98**	65(18,6)	320,069**	1,193	,551
	no	296(79,6)		271(77,7)			
I do not have time	yes	73(19,6)		68(19,5)			
	partially	121(32,5)	179,61**	200(57,3)	45,42**	4,507	,105
	no	178(47,9)		81(23,2)			
The material expenses are considerable	yes	65(17,5)		59(16,9)			
	partially	108(29,1)	218,74**	97(27,8)	81,99**	1,251	,741
	no	198(53,4)		193(55,3)			
The misunderstanding of the people around me bothers me	yes	38(10,2)		31(8,9)			
	partially	93(25,0)	355,89**	86(24,6)	185,507**	1,387	,709
	no	241(64,3)		232(66,5)			
Lack and remoteness of sports fields	yes	61(16,4)		55(15,8)			
	partially	112(30,1)	224,45**	119(34,1)	61,98**	2,209	,530
	no	199(53,5)		175(50,1)			
Nema ko da organizuje	yes	51(13,7)		52(14,9)			
	partially	117(31,5)	246,28**	119(34,1)	68,32**	1,935	,586
	no	204(54,9)		178(51,0)			
There is no one to organize	yes	49(13,2)		46(13,2)			
	partially	105(28,3)	276,79**	101(28,9)	107,62**	,970	,809
	no	217(58,5)		202(57,9)			

Legend: *Frq. - frequencies - number of subjects, χ^2 - Chi-square test,** - level of significance p< .01 inside groups, Sig - test between groups*

The obtained results show that a statistically significant difference at the level of .01 (**) was determined for all questions, whether it was about boys or girls. Analyzing the obtained results, it can be concluded that the largest number of boys (23.4%) and girls (21.8%) state that they lack exercise habits and do not feel the need to exercise (26.6% of boys and 21.5% of girls). The lack and distance of sports fields and organizations are also frequent barriers that prevent children from participating in physical activities. The results of the χ^2 test showed that there are no statistically significant differences between the groups of boys and girls. The results showed that both boys and girls have barriers to physical activity, but that they do not differ in relation to the group of respondents (Table 4).

DISCUSSION

In the area of Niš, statistically significant differences were found regarding the frequency of participation in physical activities of children aged 13 and 14, in relation to gender. The results indicate that girls reported a lower frequency of physical activities than boys. Girls often lead a sedentary lifestyle and they are often ashamed to participate in certain physical activities.[14] In studies dealing with differences in level and barriers to physical activities between girls and boys, it was found that boys are more motivated for activities that require more strength and endurance such as football, basketball, etc., while girls are more oriented towards activities that require aesthetics, flexibility and balance, which is superior when it comes to the female gender.[15] In addition, the authors came to the conclusion that boys show strong interests in archery, bowling and wrestling, and girls in gymnastics, dance, aerobics with music and volleyball.[16] Also, boys show a greater interest than girls in physical activities that bring experience by taking risks, and girls were more interested than boys in physical activities related to beautiful and harmonious movements.[17] They found that boys use more sports

[14] Portela-Pino, Iago, et al. "Gender differences in motivation and barriers for the practice of physical exercise in adolescence." *International journal of environmental research and public health* 17.1 (2020): 168.

[15] Smith, N.; Lounsbery, M.; Mckenzie, T. Physical activity in high school physical education: Impact of lesson

context and class gender composition. *J. Phys. Act. Health* 2014, 11, 127–135.

[16] Resaland, Geir K., et al. "Physical activity preferences of 10-year-old children and identified activities with positive and negative associations to cardiorespiratory fitness." *Acta Paediatrica* 108.2 (2019): 354-360.

[17] Zeng, Howard Z., Michael Hipscher, and Raymond W. Leung. "Attitudes of high school students toward physical education and their sport activity preferences." *Journal of Social Sciences* 7.4 (2011): 529.

and activities such as weightlifting, adventure sports and martial arts and have more positive attitudes than girls.[18] A significantly lower number of activities involving games (time spent outside) was recorded in girls than in boys. In girls, more time spent in sedentary activities and less time spent in light, moderate and more intense activities are recorded.[19]

The results showed that there are obstacles that prevent children from participating in physical activities, but that they do not differ significantly between boys and girls. The barriers that were most often reported by both boys and girls are that they lack exercise habits, that they do not feel the need to exercise, the lack or distance of the field, and there is no one to organize physical activity. Barriers such as Lack of habits and I don't feel the need can occur, among other things, due to a lack of knowledge about the benefits of physical activity, which tends to change with growing up and gaining knowledge about it.[20] Also, the role of parents can have an impact on the frequency of physical activity in children as well as the need for exercise. Mother and father have the main role in the formation of the child's behavior, lifestyle and habits related to participation in physical activities.[21,22] If parents have a habit of physical activity, children will probably have that need as well.[23]

The barriers mentioned by the respondents in this research are the lack and remoteness of the sport fields. Limited access to opportunities to participate in sports or exercise was identified by children and parents as a frequent barrier. This information is consistent with previous research.[24] These barriers are more common among children who live in rural areas, where sports facilities are less

[18] Ibid.

[19] Jandrić, Slavica. "Differences between boys and girls in terms of physical activity." *Facta Universitatis: Series Physical Education and Sport* 8.1 (2010): 1-7.

[20] Vanhelst, Jeremy, et al. "Physical activity awareness of European adolescents: The HELENA study." *Journal of sports sciences* 36.5 (2018): 558-564.

[21] Dasappa, Hemavathi, et al. "Prevalence, risk factors and attitude of parents towards childhood obesity among school children in Bangalore city." Int J Commun Med Public Health 5.2 (2018): 749-753.

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Int. J. Prev. Med. 2015, 6, 12.

[24] Lazarowicz, A., O'Hara, R. L., Broder, J. C., Grunberg, D. M., & Gasevic, D. (2021). Gender differences in barriers to participation in after-school physical activities and related factors in Australian schoolchildren: A cross-sectional study. *Health Promotion Journal of Australia*, 32, 139-146.

accessible.[25] In other researches, the availability of facilities is a less pronounced barrier and is rarely mentioned in relation to the barrier of lack of money, which was the most mentioned by the respondents.[26]

Lack of knowledge about the advantages and benefits of physical activities, the influence of the environment and possible psychological barriers, such as the lack of need for exercise or problems with the lack of facilities for exercise are the main reasons for not participating in physical activities. Other obstacles identified in the literature are: lack of time, interest and social support.[27] The main factors that stood out in our study are that a large number of participants from both groups stated that they do not have a habit of exercising and that they do not feel the need to exercise. The distance to the place of exercise, the lack of location for exercise and the organization itself are also a type of barrier that prevent children from participating in physical activities, which is similar to the results of other studies.

CONCLUSION

This study showed that there are significant differences between boys and girls regarding the frequency of participation in physical activities. There are many barriers to participation in physical activity. Some of them were disclosed by our research, which is crucial for addressing the topic of how to get over these challenges. Children and parents can directly improve this situation with their ideas about how children's physical activity could be better promoted. In addition, knowledge about the benefits and importance of physical activity for health is very important. Therefore, a large number of studies mention fun and enjoyment as very important reasons for children's participation in sports and exercise. Recently, there has been a significant increase in research activity in this area. However, there is not enough good quality research on evaluations and effectiveness of interventions, strategies for overcoming barriers to participation in physical activities, but also for promoting physical activity among socially disadvantaged groups of children.

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[27] Rosselli, Martina, et al. "Gender differences in barriers to physical activity among adolescents." *Nutrition, Metabolism and Cardiovascular Diseases*

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18. Ibid.
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