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STRUCTURED PHYSICAL ACTIVITY DURING SCHOOL RECESS: MORE THAN PHYSICAL FITNESS BENEFITS

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Abstract

Regular physical activity is associated with numerous health benefits in school children and adolescents. Therefore, it is important to create a supportive environment that promotes physical activity, especially in schools. In order to examine the effects of two recess-based interventions on children's physical fitness and optimism, and involvement in school's violence, a prospective study was conducted. The sample comprised of 210 primary school students attending grades one through four (101 boys, 109 girls), assigned to two Intervention groups (IG1, IG2) and a Control group (CG). For eight weeks, IG1 was provided with exercise equipment, IG2 was exposed to daily structured physical activity during recess, and CG had regular recess. Pre- and post-intervention measurements revealed significant differences ($p \leq .05$) between groups in physical fitness and optimism, with IG2 (structured physical activity) scoring most favourably. In addition, the percentage of students who were not involved in peer violence as perpetrators significantly increased in IG2 during the intervention. IG1 performed the best in the agility test, and CG achieved the lowest fitness and optimism scores. No other significant differences were detected. Structured physical activity during recess might be a promising strategy of optimising students' health and school climate.

Key words: EUROFIT, Youth Life Orientation Test, pessimism, children, exercise equipment.

СТРУКТУРИРАНА ФИЗИЧКА АКТИВНОСТ ТОКОМ ВЕЛИКОГ ШКОЛСКОГ ОДМОРА: ВИШЕ ОД КОРИСТИ ЗА ФИЗИЧКИ ФИТНЕС УЧЕНИКА

Апстракт

Редовна физичка активност је повезана са бројним здравственим користима код школске деце и адолесцената. Зато је важно обезбедити подржавајуће окружење које

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промовише физичку активност, нарочито у школама. Са циљем да се испитају ефекти две интервенције током одмора на физички фитнес, оптимизам и учешће ученика у школском насиљу, спроведена је проспективна студија. Узорак је обухватио 210 ученика првог до четвртог разреда основне школе (101 дечак, 109 девојчица), распоређених у две интервентне групе (ИГ1, ИГ2) и једну контролну групу (КГ). Током осам недеља, ИГ1 је само имала реквизите за вежбање на располагању, ИГ2 је била изложена свакодневној структурираној физичкој активности током великог одмора, док је КГ имала редовне школске одморе. Мерења пре и после интервенције показала су да постоје статистички значајне разлике између група ($p \leq .05$) у физичком фитнесу и оптимизму, при чему је најбоље резултате имала ИГ2 (структурирана физичка активност). Поред тога, проценат ученика који нису били укључени у вршњачко насиље као извршиоци је значајно опао у ИГ2 током интервенције. ИГ1 је имала најбоље резултате на тесту агилности, док је КГ постигла најслабије резултате на тестовима фитнеса и оптимизма. Друге значајне разлике нису констатоване. Структурирана физичка активност током великог школског одмора може представљати обећавајућу стратегију оптимизације здравља ученика и школске климе.

Кључне речи: EUROFIT, Youth Life Orientation Test, песимизам, деца, спортски реквизити.

INTRODUCTION

Although the benefits of regular physical activity on youths' health are well documented (Janssen & LeBlanc, 2010), 81% of adolescents globally do not meet the minimum physical activity recommendations (Guthold et al., 2020). In order to facilitate an active lifestyle, a supportive environment should be created, thus making healthy choices the easier ones. These principles, set by the Ottawa Charter (World Health Organization, 1986), have been implemented in Health Promoting Schools (HPS), introduced in Europe for the first time in 1992. HPS approach calls for employing all school resources and partnerships in the promotion of the health of students and staff, which includes physical activity.

Children can be physically active during physical education classes, in school sports clubs, while staying in extended stay, during active breaks in classrooms, while actively commuting to/from schools, or during school recess. Although recess is part of a regular school day in every school in Serbia, there is currently no legislation to regulate the duration, organisation, and content of school recess (Kermeci & Đorđić, 2018). The study revealed that the duration of recess ranges between 10 and 30 minutes, with a modal value of 20 minutes. In most cases, it follows the second lesson in the elementary school daily schedule. Besides the main recess, there are also short 5-minute recesses between lessons.

Although school recess provides the opportunity for physical activity, not many students spend at least 40% of the recess time in moderate-to-vigorous physical activity (MVPA) as recommended (Ridgers et al., 2006). Previous research suggests that boys are more active than girls during recess (Stratton 1999, 2000; Zask et al., 2001; Greca & Silva,

2017). In order to promote students' physical activity, schools can offer more structured activities, led by a trained adult, which can result in increased levels of MVPA during recess (Howe et al., 2012; Larson et al., 2014; Black et al., 2015; Coolkens et al., 2018). On the other hand, unstructured recess, might be a more favourable context for students to focus, develop social skills, collaborate and improve mood (Parrot & Cohen, 2020). Some simple and feasible interventions, like multi-colour playground markings, zonal design, and increased equipment availability, turned out to be effective in terms of physical activity promotion (Stratton & Mullan, 2005; Verstraete et al., 2006; Ridgers et al., 2007; 2010).

Considering the effects of structured and unstructured recess activities on physical fitness, a recent study detected similar improvements of cardiorespiratory fitness in both intervention and control schools, besides increased level of light and moderate physical activity during week days (Casolo et al., 2019). Authors suggest that children's spontaneous physical activity during recess might be comparable to the structured one led by adults. Thus, further effort to promote physical activity should target other parts of the school day (Casolo et al., 2019). Another study combined structured aerobic exercises and cognitively engaging physical activities in a 22-week recess intervention (Van der Niet et al., 2016). Although the intervention improved some aspects of executive functioning in primary school children, no significant differences were detected in physical fitness components. The lack of the intervention's effects on students' physical fitness, which was the case in other studies as well (St Laurent et al., 2019; Latorre-Román et al., 2021), might be explained, to some extent, by implementation challenges and methodological issues. On the other hand, it is possible that not every child responds identically to different types of recess. An interesting study, conducted on a sample of preschool children, suggests that the least active children might benefit the most from structured recess that includes adult led physical activities (Frank et al., 2018). In addition, while a higher provision of recess is correlated with a higher physical activity level, no such relationship was found with physical fitness (Clevenger et al., 2023).

Besides opportunities for physical activity, recess provides children academic, cognitive, behavioural, and emotional benefits, according to a recent review study (Hodges et al., 2022). School recess is seen as a vital social space for children and adolescents, although it has long been associated with violence, bullying, and social exclusion (McNamara, 2021). According to McNamara (2021), children prioritise the social aspect of recess – things happening at recess have a substantial social and emotional weight for them. Changing recess might actually contribute to changing the school's social climate and to reducing violence. Providing structure and additional supervision, and/or developing social skills

through recess activity, could contribute to students' having a more positive school experiences.

Bearing in mind the relevance of school recess as an important facet of the growing-up environment of school children, a study was conducted in order to examine the effects of two recess physical activity interventions on students' physical fitness and optimism, and their involvement in school violence. The study is the first of its kind to compare the effects of different recess interventions on Serbian school children's wellbeing and school climate, as well.

METHODS

Study Participants

The study employed the quasi-experimental design, with two intervention groups, and one control group. Both interventions lasted for eight weeks. Participants were recruited from four rural elementary schools (Sečanj municipality): „Veljko Đuričin" in Jarkovac, „Braća Stefanović" in Neuzina, „Vuk Karadžić" in Konak, and „Stevan Aleksić" in Jaša Tomić. All of the villages are located in a sparsely populated agricultural area in the Central Banat District of the Autonomous Province of Vojvodina, Serbia.

The schools were primary sample units, and they were assigned to the Intervention or the Control programme randomly. The first Intervention group (IG1) consisted of students attending grades one through four in elementary schools in Konak and Jarkovac, the second Intervention group (IG2) consisted of students attending grades one through four in Neuzina, and the Control group (CG) consisted of students attending grades one through four in Jaša Tomić.

The IG1 group was provided with exercise equipment during recess, the IG2 group participated in structured physical activity at recess, while members of the CG spent recess any way they wanted to. Pre- and post-intervention measurements included: level of fitness, optimism, and involvement in school violence. The obtained data was analysed by appropriate statistical methods.

The basic sample characteristics are presented in Table 1. The total sample consisted of 210 participants (101 boys and 109 girls), with 70 students per each study group (IG1, IG2, CG). Only students attending grades one through four participated. Parents provided informed consents for their children to participate, and the approvals of the schools' principals were also obtained.

Table 1. Basic sample characteristics (N = 210)

Group		Boys	Girls	Total
IG1		27	43	70
	1st grade	4	10	14
	2nd grade	8	13	21
	3rd grade	6	9	15
	4th grade	9	11	20
IG2		34	36	70
	1st grade	10	9	19
	2nd grade	6	12	18
	3rd grade	9	8	17
	4th grade	9	7	16
CG		40	30	70
	1st grade	8	6	14
	2nd grade	9	11	20
	3rd grade	9	5	14
	4th grade	14	8	22
Total:		101	109	210

Note: IG1 – first Intervention group (equipment provided); IG2 – second Intervention group (structured physical activity); CG – Control group.

Measures

Physical fitness. In order to assess physical fitness components, the following EUROFIT tests were applied (EUROFIT, 1993): *Standing Broad Jump* - STBJ (measures lower-body power), *Sit-Ups in 30 seconds* - SU30 (measures abdominal muscular endurance), *Bent Arm Hang* - BAHG (measures upper-body muscular endurance), *Sit-and-Reach* - SEAT (measures flexibility), and *10x5 m Shuttle Run* – 10x5 (measures running speed and agility). In addition, the *1.6 km Run/Walk* - 1600 test was used for aerobic capacity assessment (Meredith & Welk, 2013).

Optimism. The Youth Life Orientation Test (YLOT) was used for the self-assessment of optimism and pessimism, and the subscales scores were then used to calculate the general optimism score (Ey et al., 2005). The YLOT consists of 16 items, out of which four items serve as fillers. Each subscale (Optimism and Pessimism) contains 6 items (statements), and participants are required to rate to what extent these statements apply to them: true for me (score 3), sort of true for me (2), sort of not true for me (1), and not true for me (0). An example of an Optimism subscale item is: "When I'm not sure what will happen next, I usually expect it to be something good". Items that measure Pessimism describe negative expectations, like "Things usually go wrong for me". A subscale score is the sum of scores of associated items (it can range from 0 to 18), while the Total Optimism score is calculated by adding up the Optimism subscale score and the inverse Pessimism subscale score. The YLOT scales showed acceptable internal reliability, with Cronbach's Alpha coefficients ranging between 0.61 and 0.65.

Involvement in school violence. Participants answered three questions related to the frequency of: (1) themselves acting as bullies towards peers during the previous two months; (2) them being violent towards teachers during the previous two months; and (3) them being the victims of peer violence during the previous two months. The items were selected from the wider school violence survey (Popadić, Plut, & Pavlović, 2009). The two months period purposefully coincided with the duration of the interventions.

The Description of the Interventions

Two school-based interventions (IG1 and IG2) aiming to promote physical activity during recess were applied daily for eight weeks in total. During the same period, the control group (CG) was also observed. Pre- and post-intervention measurements were conducted in order to compare the effects of IG1, IG2, and CG recess activities on students' physical fitness, self-rated optimism, and level of school violence.

The first Intervention group (IG1) was provided with exercise equipment during a 10-minute recess in order to encourage students' physical activity. The equipment included: hoops, balls, badminton sets, table tennis sets, mini hurdles, ropes, cones, sticks, rubber bands, Frisbees, tractor tires, a bar, and hopscotch courts were drawn on the playground. Before the intervention, the physical education teacher organised a short demonstration of different ways the equipment might be used. No other incentives or guidelines were provided during the intervention. Students were allowed to use the equipment the way they wanted, and as long as they wanted to. They could switch from one to another piece of equipment, or share the pieces with other students. Adults supervised students during the recess, as is usual.

The second Intervention group (IG2) participated in structured physical activity during a 10-minute recess. The activities were led by the physical education teacher, and all students were supposed to take part in the activities. The intervention included the following activities: 1st week – dance aerobics; 2nd week – folk dances, 3rd week – cooperative running games, 4th week – cooperative running games, 5th week – throwing games, 6th week – relay games, 7th week – "Make the letter" game, and 8th week – obstacle course. The intervention provided participants with an additional 50 minutes of well-rounded physical activity weekly.

Students in the Control group (CG) were involved in spontaneous recess activities, i.e. they were allowed to spend recess time the way they preferred. No encouragements for active play or physical activity were provided, including additional exercise equipment. Students simply engaged in regular recess activities like walking, sitting and chatting, and playing.

Data Collection Organisation

Before field data collection, all necessary consents were obtained, including parents' informed consents and the approvals of the schools' princi-

pals. The participating schools provided the conditions for standardised measurement procedures. Data was collected and analysed in accordance with the ethical guidelines of the WMA Declaration of Helsinki (WMA, 2013).

Pre-intervention measurements were conducted in the week preceding the implementation of the interventions, while post-intervention measurements were done the first week following the end of the interventions.

Fitness testing was organised in the schools' gyms during morning hours, and self-reports on optimism and involvement in school violence were completed in classrooms.

Data Analysis

Descriptive statistics was employed, including mean (M) and standard deviation (SD) for interval variables. In addition, intergroup differences at the final measurement were tested by multivariate and univariate analyses of covariance (MANCOVA, ANCOVA). The effect size was assessed by partial eta-squared (η2).

For categorical variables, absolute and relative frequencies were determined using the Chi-squared test. The significance level was set at $p \leq .05$. Data was analysed in the statistical software SPSS for Windows, version 20.0.

RESULTS

Differences in Physical Fitness

The MANCOVA revealed a statistically significant difference in the adjusted means between the groups (IG1, IG2, CG) on the fitness variables ($F = 14.813$, $Q = .000$, Wilks' $\Lambda = .23$, partial $\eta^2 = .52$ (Table 2)). The ANCOVA detected significant univariate effects of the interventions ($p = .00$) on the following variables: BAHG, SEAT, 10x5, and 1600.

Table 2. MANCOVA and ANCOVA results: differences between IG1, IG2 and CG in fitness variables

	IG1		IG2		CG		F	*p*	η^2
	M	SD	M	SD	M	SD			
STBJ	119.77	2.86	123.92	1.52	122.73	1.43	0.80	0.45	0.02
SU30	15.46	0.86	14.68	0.46	14.75	0.43	0.33	0.72	0.01
BAHG	8.04	1.99	11.86	1.06	5.14	0.99	9.16	**0.00**	0.17
SEAT	1.79	0.72	3.93	0.38	1.37	0.36	10.66	**0.00**	0.20
10x5	23.89	0.38	26.43	0.20	27.41	0.19	33.97	**0.00**	0.44
1600	9.19	0.37	7.88	0.20	10.11	0.19	29.04	**0.00**	0.40
Wilks' lambda = 0.23; F=14.813; Q= 0.00; η^2=0.52									

Note: STBJ – Standing broad jump; SU30 – sit-ups in 30s; BAHG – Bent arm hang; SEAT – Seat-and-reach; 10x5 – 10x5 m shuttle run; 1600 – 1.6 km run/walk; M – Mean; SD – standard deviation; F – F test; Q – F test significance level; η^2 - partial eta-squared

Pairwise comparisons (LSD test) revealed that the IG2 intervention (structured activity) had significantly more favourable effects than regular recess on the above mentioned variables, and significantly better results than IG1 on the flexibility (SEAT) and aerobic capacity (1600) tests (Table 3). On the other hand, the IG1 group was superior both to IG2 and CG in agility (10x5). No other significant difference between groups was found.

Table 3. Pairwise comparisons between control and intervention groups in physical fitness variables (LSD test)

	Group	M (SD)	Group	M (SD)	*p*
	IG1	119.77 (2.86)	IG2	123.92 (1.52)	.209
STBJ	IG1	119.77 (2.86)	CG	122.73 (1.43)	.365
	IG2	123.92 (1.52)	CG	122.73 (1.43)	.600
	IG1	15.46 (0.86)	IG2	14.68 (0.46)	.433
SU30	IG1	15.46 (0.86)	CG	14.75 (0.43)	.469
	IG2	14.68 (0.46)	CG	14.75 (0.43)	.923
	IG1	8.04 (1.99)	IG2	11.86 (1.06)	.099
BAHG	IG1	8.04 (1.99)	CG	5.14 (0.99)	.204
	IG2	11.86 (1.06)	CG	5.14 (0.99)	**.000**
	IG1	1.79 (0.72)	IG2	3.93 (0.38)	**.012**
SEAT	IG1	1.79 (0.72)	CG	1.37 (0.36)	.609
	IG2	3.93 (0.38)	CG	1.37 (0.36)	**.000**
	IG1	23.89 (0.38)	IG2	26.43 (0.20)	**.000**
10x5	IG1	23.89 (0.38)	CG	27.41 (0.19)	**.000**
	IG2	26.43 (0.20)	CG	27.41 (0.19)	**.001**
	IG1	9.19 (0.37)	IG2	7.88 (0.20)	**.003**
1600	IG1	9.19 (0.37)	CG	10.11 (0.19)	**.032**
	IG2	7.88 (0.20)	CG	10.11 (0.19)	**.000**

Note: STBJ – Standing broad jump; SU30 – sit-ups in 30s; BAHG – Bent arm hang; SEAT – Seat-and-reach; 10x5 – 10x5 m shuttle run; 1600 – 1.6 km run/walk; M – Mean; SD – standard deviation; p – level of significance.

Differences in Optimism

The MANCOVA confirmed the significant difference between the Control and Intervention groups in YLOT scores at post-intervention measurement ($F = 6{,}244$, $Q = 0.00$, Wilks' $\Lambda = .88$, partial $\eta^2 = 0.064$ (Table 4)). Significant univariate effects of the interventions were identified for the Pessimism and Total Optimism scales (ANCOVA).

The results of the pairwise analysis (LSD test), presented in Table 5, suggest that the participants in the Control group had significantly higher Pessimism and lower Total Optimism scores than the participants in both Intervention groups. In addition, students who were exposed to structured physical activity during recess (IG2) scored significantly lower on the Pessimism scale, and higher on the Total Optimism scale than students in IG1 (equipment provided).

Table 4. MANCOVA and ANCOVA results: differences between IG1, IG2 and CG in YLOT scores

	IG1		IG2		CG		F	*p*	η^2
	M	SD	M	SD	M	SD			
Optimism	16.18	0.23	16.76	0.26	16.84	0.26	2.11	0.125	0.022
Pessimism	5.05	0.40	3.61	0.46	6.27	0.46	8.59	**0.000**	0.085
Total optimism	29.13	0.54	31.15	0.60	28.58	0.62	5.17	**0.007**	0.053
F = 6.244; Q = 0.00; Wilks' lambda = 0.876; η^2=0.064									

Note: M – Mean; SD – standard deviation; F – F test; Q – F test significance level; η^2 – partial eta-squared.

Table 5. Pairwise comparisons between control and intervention groups in YLOT scores (LSD test)

	Group	M (SD)	Group	M (SD)	*p*
	IG1	16.18 (0.23)	IG2	16.76 (0.26)	.100
Optimism	IG1	16.18 (0.23)	CG	16.84 (0.26)	.067
	IG2	16.76 (0.26)	CG	16.84 (0.26)	.807
	IG1	5.05 (0.40)	IG2	3.61 (0.46)	**.019**
Pessimism	IG1	5.05 (0.40)	CG	6.27 (0.46)	.057
	IG2	3.61 (0.46)	CG	6.27 (0.46)	**.000**
	IG1	29.13 (0.54)	IG2	31.15 (0.60)	**.014**
Total optimism	IG1	29.13 (0.54)	CG	28.58 (0.62)	.514
	IG2	31.15 (0.60)	CG	28.58 (0.62)	**.003**

Note: M – Mean; SD – standard deviation; p – level of significance.

Differences in Involvement in School Violence

The effects of the interventions on the students' involvement in school violence were analysed by the Chi-squared test. Three indicators were observed: (1) students as victims of peer violence; (2) students as perpetrators of violence towards peers; and (3) students as perpetrators of violence towards teachers. The results of the Chi-squared tests for IG1 (equipment provided) indicated that there was no significant difference in the numbers of students who were victimised by schoolmates before and after the intervention (χ^2 (df=2) = 3.96; p = 0.14). The same was concluded for students as perpetrators of violence towards peers (χ^2 (df=2) = 0.38; p = 0.83), and towards teaching staff (χ^2 (df=2) = .53; p = .77).

Considering IG2 (structured physical activity), no significant differences were observed in the 'students as victims of peer violence' indicator (χ^2 (df=2) = .24; p = .12), and the 'students as perpetrators of violence towards teachers' indicator (χ^2 (df=2) = 4.62; p = .10). However, after the intervention, the percentage of students who were involved in peer violence as perpetrators significantly differed in comparison to the pre-intervention data (Table 6). The number of students who had never

been involved in peer violence as perpetrators increased from 51.4% to 81.4%, while the category 'involved once or twice' recorded a decrease of 31.4 percent points.

Table 6. *IG2 students (structured physical activity) as peer violence perpetrators before and after the intervention*

	Involved as perpetrator in school peer violence in last two months			
	Never	Once or twice	Many times or daily	Total
Before the intervention	36 (51.4%)	29 (41.4%)	5 (7.1%)	70 (100.0%)
After intervention	57 (81.4%)	7 (10.0%)	6 (8.6%)	70 (100.0%)
	χ^2 (df=2) = 18.28		p = .0001	

Among students who were involved in regular recess activities (CG), no significant differences were identified in victimisation (χ^2 (df=2) = 1.15; p = .57), in acting as perpetrators of peer violence (χ^2 (df=2) = 0.19; p = .91), or in acting as perpetrators of violence towards teachers (χ^2 (df=2) = 0; p = 1.0).

DISCUSSION

The effects of two eight weeks long recess interventions on the students' physical fitness and optimism, as well as their involvement in school violence, were analysed and compared to the Control group. The first Intervention group (IG1) was provided with exercise equipment, with no additional exercise guidelines or encouragement, except for a brief initial demonstration of how to use the equipment. The other Intervention group (IG2) was exposed to daily structured physical activity, led by a physical education teacher, while the members of the Control group (CG) were engaged in spontaneous recess activities throughout the eight observed weeks.

The study was conducted in small rural schools, with children attending grades one through four. The post-intervention measurement pointed out significant differences between the groups in physical fitness, particularly in muscular endurance (upper arm muscles, abdominal muscles), flexibility, and aerobic capacity. On the other hand, the provision of exercise equipment led to superior results in agility in comparison to structured and regular recess, with no other significant differences between the groups. In contrast to some previous studies (van der Niet et al., 2016; St Laurent et al., 2019; Latorre-Román et al., 2021), structured intervention proved to be more efficient in terms of fitness improvement than the activities of the Control group. However, similar to Casolo et al.

(2019), the non-structured intervention also contributed to children's fitness, namely to agility/running speed, exceeding both the structured and regular recces group. A possible explanation for these results lies in the characteristics of the interventions applied; before the intervention, IG1 participants received brief training about exercise equipment and how to use it, and the equipment provided enabled them to engage in various physical activities, from rope jumping to playing with a tractor tire. Some quality data from the process evaluation implies that the most popular pieces of equipment were hoops, balls, badminton sets, table tennis sets, mini hurdles, ropes, and cones that might stimulate agility movements, thus contributing to the improvement of this fitness component. On the other hand, the structured recess provided students in IG2 with an additional 50 minutes of well-rounded physical activity weekly, led by a trained adult, who was able to organise, motivate and monitor the students' activity, which resulted in significantly higher achievements in four fitness components.

In addition, the Control group performed the worst on the Pessimism and Total Optimism scales, when compared to the Intervention groups. Again, students who engaged in structured physical activity during recess (IG2) had the most favourable scores in comparison to both CG and IG1 (equipment provided). It is possible that structured activities, which mostly engaged the whole group, initiated more meaningful interactions between students, thus enhancing group identity and sense of belonging. This might have led to decreased level of pessimism and increased total optimism.

Considering students' involvement in school violence, structured physical activity turned out to be the most efficient. Three indicators were observed: (1) students as victims of peer violence; (2) students as perpetrators of violence towards peers; and (3) students as perpetrators of violence towards teachers. When pre- and post-intervention results were examined, no significant differences were identified in the observed indicators for IG1 (equipment provided) and CG. However, structured physical activity led to a significant increase in the number of students who had never been involved in peer violence as perpetrators, which might be explained by the fact that exercising together could have prevented children from engaging in aggressive behaviours, with additional adult supervision provided.

Previous studies suggest that school violence is associated with a lack of structure and adult supervision, with school recess usually meeting both criteria (Vaillancourt et al., 2010; Popadić, Plut, & Pavlović, 2014; McNamara et al., 2015;). Structured physical activity, besides improving physical fitness, might provide students with opportunities to develop social skills, connect with each other, and learn how to solve conflicts, which in turn can contribute to a decrease in violent behaviour.

Further development of recess physical activity models can be a promising strategy for improving the school climate, since it requires collaboration between the teaching staff, students, and parents, and could enhance togetherness among students (Jevtić & Milošević, 2021).

CONCLUSION

This study examined the effects of two eight weeks long recess physical activity interventions on elementary school students' physical fitness and optimism, and their involvement in school violence. The study employed the pre-test/post-test quasi-experimental design, with two Intervention groups (IG1: exercise equipment provided during recess; IG2: structured recess physical activity led by a physical education teacher), and one Control group (CG: regular recess). The participants were primary school students attending grades one through four, both girls and boys, recruited from four rural schools in the Central Banat District in Serbia.

It can be concluded that structured physical activity intervention resulted in the most favourable outcomes regarding the students' physical fitness, optimism, and violent behaviour. The least effective was regular recess, while the provision of exercise equipment had a positive effect on the students' agility level.

The limitations of this study are related to sample characteristics and the relatively short duration of the interventions. However, this is the first study to evaluate the effects of different recess physical activity interventions on a sample of Serbian school children. The study employs a prospective design, and provides a solid ground for the practical application of similar locally-based recess interventions.

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СТРУКТУРИРАНА ФИЗИЧКА АКТИВНОСТ ТОКОМ ВЕЛИКОГ ШКОЛСКОГ ОДМОРА: ВИШЕ ОД КОРИСТИ ЗА ФИЗИЧКИ ФИТНЕС УЧЕНИКА

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Резиме

Иако су предности редовног бављења физичком активношћу за здравље деце и адолесцената добро познате, чак 81% адолесцената не испуњава минималне препоруке за физичку активност. У складу са савременим принципима промоције здравља, неопходно је обезбедити средину која подржава физичку активност, што важи и за школску средину. Поред наставе физичког васпитања, деца могу бити физички активна у школи за време спортских секција, у продуженом боравку, током активног транспорта, активних пауза и школског одмора. Постојећа истраживања показују да мањи број ученика активно проводи велики школски одмор, при чему су дечаци активнији од девојчица. Са циљем да се испитају ефекти две различите интервенције, усмерене на велики школски одмор, на физички фитнес, оптимизам и учествовање ученика у школском насиљу, спроведено је проспективно истраживање на узорку од 210 ученика (101 дечака и 109 девојчица) прва четири разреда сеоских основних школа из општине Сечањ. За процену физичког фитнеса коришћени су тестови из ЕУРОФИТ батерије тестова: Скок у даљ из места (STBJ), Подизање у сед за 30 секунди (SU30), Издржај у згибу (BAHG), Дубоки претклон (SEAT) и Чунасто трчање 10x5 метара (10x5), као и трчање на 1.600 метара (1600). Оптимизам ученика процењиван је помоћу упитника Youth Life Orientation Test (YLOT), који се састоји из субскала Оптимизам и Песимизам, а скорови на овим субскалама омогућавају израчунавање скора општег оптимизма. Учествовање ученика у школском насиљу посматрано је помоћу три индикатора: (1) ученици као починоци насиља према вршњацима током последња два месеца, (2) ученици као извршиоци насиља према наставницима током последња два месеца, и (3) ученици као жртве вршњачког насиља током последња два месеца. Интервенције су трајале укупно осам недеља. Прва интервентна група (ИГ1) имала је доступну опрему за вежбање (вијаче, обручи, лопте, рекети, итд.), а пре почетка интервенције наставник физичког васпитања им је кратко објаснио како се реквизити могу користити. Друга интервентна група (ИГ2) учествовала је у структурираним физичким активностима током великог одмора сваког школског дана. Активности су се мењале сваке недеље, водио их је наставник физичког васпитања и укључивале су веома разноврсне активности, од народних плесова и аеробика, до полигона. Ученици у контролној групи (КГ) су током осам недеља имали редовне школске одморе. Резултати MANCOVA и ANCOVA анализе показали су да између група постоје статистички значајне разлике у простору варијабли физичког фитнеса и оптимизма ($p \leq .05$). ИГ2 била је најуспешнија у тестовима за процену издржљивости мишића руку, флексибилности и аеробне издржљивости, док је ИГ1 имала најбоље резултате у агилности. КГ је имала највише скорове на субскали песимизма и најнижи скор на Укупном оптимизму, док су ученици који су учествовали у структурираном вежбању (ИГ2) остварили најпозитивније резултате у овом простору. Такође, тестирање хи-квадрат тестом показало је да је у овој групи дошло до значајног пораста процента ученика који никада нису били укључени у насиље над вршњацима, док то није био случај у првој интервентној и контролној групи. Може се закључити да структурирана физичка активност током великог одмора може допринети оптимизацији здравља ученика и бољој школској клими.