DOI: 10.7251/SSH1402093DJ
Originalni naučni rad

UDC: 796.012.1:613.72
Original Scientific Paper

Vannastavna fizička aktivnost dece starijeg školskog uzrasta i nivo kardiorespiratorne forme

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Sažetak: Istraživanje sa ciljem procene vannastavne fizičke aktivnosti i fizičke forme sprovedeno je na uzorku od 333 učenika starijeg školskog uzrasta. Analize su sprovedene prema polu, školskom urastu i vannastavnoj fizičkoj aktivnosti. Učenici i učenice petih razreda su najmanje uključeni u vannastavnu fizičku aktivnost. Učenici su aktivniji u odnosu na učenice. Kod učenika i učenica koji nisu fizički aktivni vrednosti indeksa telesne mase su povišene (gojaznost kod fizički neaktivnih učenika je 5.2 – 6.2%, kod učenica 3.4 – 6.7%, dok je kod fizički aktivnih učenika 1.2-1.4%, i učenica 0.7-2.1%). Kod učenica, u svim analiziranim grupama zabeležena je gojaznost. Osim kod učenica petog razreda, između svih ostalih grupa ispitanika, zabeležena je statistički značajna razlika u odnosu na vrednosti kardirespiratorne forme, u korist ispitanika koji su imali vannastavnu fizičku aktivnost. Kardiorespiratorna forma je uglavnom ispod nivoa dobrih u odnosu na optimalne kriterijume.
Ključne reči: fizička forma, zdravlje, gojaznost, deca.

Uvod

Srbija je među deset demografski najstarijih zemalja sveta, tako da danas u zemlji živi više starijih od 65 godina, nego mlađih od 15. Zdravstveni i radni status današnje školske populacije, je zbog toga veoma bitan.

Stariji školski uzrast (uzrast od 11 do 15 godina) karakteriše proces rasta i psiho-fizičkog sazrevanja, socijalizacije, vaspitanja i školovanja. Zdravstveno stanje i kvalitet života u ovom periodu uslovljeni su mnogobrojnim faktorima, između ostalog, i odnosom prema fizičkoj aktivnosti. Redovna fizička aktivnost je od izuzetnog značaja, pošto je povezana sa zdravljem i dugovečnošću (Lee, Paffenbarger i Hennekens, 1997; Paffenbarger, Hyde, Wing i Hsieh, 1986), predisponiranošću ka gojaznošću (Goran i Treuth, 2001), psiho-fizičkim

Extracurricular Physical Activity of Children of Older School Age and Cardiorespiratory Fitness Level

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Abstract: The basic goal of this study was to estimate extracurricular physical activity and physical fitness level on a sample of 333 children of older school age. Analyses were performed by gender, school age and extracurricular physical activities. Pupils of 5th grade were at least involved in extracurricular physical activity. Boys are more active than girls. For pupils who are not physically active body mass index values were increased (obesity rate in physically inactive boys was 5.2 - 6.2%, and girls 3.4 - 6.7%, whereas in physically active boys 1.2-1.4% and girls 0.7-2.1%). For schoolgirls, in all analyzed groups obesity was observed. Except in 5thgrade, among all other groups of subjects was statistically significant difference compared to the values cardiorespiratory fitness in favor of the respondents who had extracurricular physical activity. Cardiorespiratory fitness is generally below the level of good as compared to norms for this age.
Key Words: physical fitness, health, obesity, children.

Introduction

Serbia is among the ten demographically oldest countries in the world, with more population over the age of 65 years old instead younger than 15. The health and employment status of today's school-age population is therefore very important.

Older school age children (ages 11 to 15 years) are characterized by the growth process and psycho-physical maturation, socialization, education and schooling. Health status and quality of life in this period are determined by many factors, among others, the attitude toward physical activity. Regular physical activity is of great importance, since it is associated with health and longevity (Lee, Paffenbarger & Hennekens, 1997; Paffenbarger, Hyde, Wing & Hsieh, 1986), predisposition to obesity (Goran

blagostanjem (Steptoe i Butler, 1996), i kognitivnom funkcionalnošću dece (Sibley i Etnier, 2003). Rizik po zdravstveni status školske dece predstavlja: hipokinezija i neadekvatna ishrana (gojaznost) koji su međusobno povezani, i koji u sinergiji dovode do poremećaja posturalnog statusa. Hipokinezija predstavlja nedovoljan nivo aktivnog kretanja, odnosno, nivo telesne aktivnosti, koji je hronično ispod praga nadražaja i koji omogućava održavanje funkcionalnog kapaciteta najvažnijih organskih sistema (Hollmann, 1975). Svetska zdravstvena organizacija (SZO) je proglasila hipokineziju za faktor rizika broj 1, kada je u pitanju ljudsko zdravlje, a posebno ugrožene kategorije su deca i adolescenti. Kardiovaskularna oboljenja nisu karakteristična za dečiji uzrast, ali istraživanja ukazuju da deca sa manjom fizičkom aktivnošću imaju predispoziciju ka riziku od ovih oboljenja (Wedderkopp, Froberg, Hansen, Riddoch i Andersen, 2003; Boreham i Riddoch, 2001). Nedovoljan nivo fizičke aktivnosti dovodi do nastanka gojaznosti, koje je najštetnija posledica neaktivnosti (Pretience i Jebb, 1995). Gojaznost je hronična bolest koja se ispoljava prekomernim nakupljanjem masnog tkiva u organizmu i povećanjem telesne mase, a u kliničkoj praksi najčešće iskazuje preko indeksa telesne mase (Tsigos i sar., 2008). SZO je gojaznost je okarakterisala kao epidemiju (WHO, 2000). U dečijem uzrastu bitno utiče na zdravlje i kvalitet života detea, i vodi ka ozbiljnim zdravstvenim oboljenjima u odraslom dobu: diabetes Tipa 2, povišen krvni pritisak i kardiovaskularna oboljenja (Cameron i sar., 2003; Guo i sar., 2000; Whitaker, Wright, Pepe, Seidel i Dietz, 1997; Power, Lake i Cole, 1997). Ponašanje deteta igra jednu od ključnih uloga u razvoju gojaznosti (Burke, 2006), pre svega podrazumevajući način ishrane i nivo fizičke aktivnosti. Sedentarni način života i povećana telesna težina, zajedno, sistematski deluju i dovode do pojave i razvoja lošeg držanja tela, odnosno telesnih deformiteta.

Fizička forma predstavlja merljivu komponentu navika pojedinca po pitanju učešća i fizičkoj aktivnosti i vežbanju. Američki koledž za sportsku medicinu naveo je razloge za procenu elemenata fizičke forme (ACSM, 2009), prvi, predstavlja usmeren ka edukaciji ispitanika o trenutnom nivou elemenata fizičke forme, i poređenje dobijenih parametara sa standardima za pol i uzrast, drugi je primena dobijenih rezultata za dizajniranje programa vežbanja. Fizička forma povezana sa zdravljem, definisan je kao skup pet različitih i merljivih elemenata fizičke forme koji su povezani sa optimalnim zdravstvenim statusom, a koji obuhvataju kardiorespiratornu formu, telesnu strukturu, mišićnu snagu, mišićnu izdržljivost i fleksibilnost (ACSM, 2010).

& Treuth, 2001), psycho-physical well-being (Steptoe & Butler 1996), and cognitive functionality of children (Sibley & Etnier, 2003). Risk to health status of school children presents: hypokinesia and inadequate nutrition (obesity), which are linked, and in synergy lead to disorders of postural state. Hypokinesia represents an insufficient level of active movement, i.e., the level of physical activity, which is below the threshold of chronic stimuli that allows the maintenance of the functional capacity of most organ systems (Hollmann, 1975). The World Health Organization (WHO) has declared hypokinesia for a risk factor number one to human health, especially vulnerable are categories of children and adolescents.

Cardiovascular diseases are not characteristic in childhood, but research suggests that children with less physical activity have a predisposition of risk of these diseases (Wedderkopp, Froberg, Hansen, Riddoch & Andersen, 2003; Boreham & Riddoch, 2001). Low levels of physical activity lead to the development of obesity, which is the most harmful consequences of inactivity (Pretience & Jebb, 1995). Obesity is a chronic disease that is manifested by excessive accumulation of fat in the body and increasing body mass, and in clinical practice, usually expressed through body mass index (Tsigos et al., 2008). WHO characterized obesity as epidemic (WHO, 2000), and in childhood significantly affects the health and quality of life, and leads to serious health disorders in adulthood: Diabetes Type 2, high blood pressure and cardiovascular disease (Cameron et al., 2003; Guo et al., 2000; Whitaker, Wright, Pepe, Seidel & Dietz, 1997; Power, Lake & Cole, 1997).

The child‘s behavior plays a key role in the development of obesity (Burke, 2006), primarily by assuming diet and level of physical activity. Sedentary lifestyles and increased body weight, together systematically lead to the appearance and development of poor posture and physical deformities.

The physical fitness is a measurable component of the individual in terms of participation and physical activity and exercise. The American College of Sports Medicine noted reasons for the assessment of the elements of physical fitness (ACSM, 2009), first, is directed towards educating about the current level of physical fitness elements, and comparison of the parameter standards for age and sex, the second is the application of the results obtained for designing exercise program.

Health related physical fitness is defined as a set of five different elements and measurable physical forms which are associated with optimal health status, and include: cardiorespiratory fitness, body structure, muscular strength, muscular endurance and flexibility (ACSM, 2010).

Kardiorespiratorna forma definiše se kao sposobnost kardiovaskularnog i respiratornog sistema da dopreme kiseonik do aktivne muskulature tokom kontinuirane fizičke aktivnosti, odnosno, sposobnost organizma da kontinuirano izvodi pokrete velikim grupama mišića umerenog do visokog intenziteta. Visok nivo kardiorespiratorne forme u detinjstvu i adolescenciji je povezan sa zdravstvenim stanjem kardiovaskularnog sistema tokom ovih godina (Mesa i sar., 2006 a,b), i kasnije u toku života (Ruiz i sar., 2006 a, b). Kardiorespiratorna forma, se u najčešće identifikuje sa aerobnom sposobnošću, odnosno, maksimalnom potrošnjom kiseonika (VO_{2max}) koja je izražena u l/min, ml/kg/min ili MET-ima. Najvažniji simptom hipokinezije je upravo smanjenje aerobne sposobnosti (Čizmić, 1992; Saltin i Rowel, 1980).

Problem istraživanja je utvrđivanje elemenata fizičke forme povezane sa zdravljem učenika, koja može da posluži kao evaluacija kurikuluma fizičkog vaspitanja.

Metod rada

Uzorak ispitanika činilo je 333 učenika (156 učenika i 177 učenica), starijeg školskog uzrasta, od petog do osmog razreda osnovnih škola na teritoriji grada Novog Sada. Kao kriterijumska, korištena je varijabla (analiza grupe ispitanika) koja je dobijena anketom: REDOVNO VEŽBANJE – sa tri odgovora: gotovo nikad (jednom nedeljno ili nijednom), često (2-3 puta nedeljno) i uvek (više od 3 puta nedeljno). Za procenu morfološkog statusa, korištene su tri varijable: TELVIS – telesna visina, TELMAS – telesna masa i BMI – indeks telesne mase (body mass index). Prilikom merenja vrednosti antropometrijskih parametara, korišćen je Internacionalni biološki program (Weiner i Lourie, 1969). BMI je dobijen formulom (kg/m^2= težina(kg) / visina(m))^2, a klasifikacija ispitanika prema vrednostima prekomerne uhranjenosti i gojaznosti za decu i adolescente (Cole, Bellizzi, Flegel i Dietz, 2000). Za procenu kardiovaskularne forme korišten je: SHUTTLE (Shuttle run test) (Eurofit, 1993). Analize su sprovedene prema polu (učenici / učenice), školskom uzrastu (razredi) i vannastavnoj fizičkoj aktivnosti. Za dobijene rezultate izračunati su deskriptivni statistički parametri (aritmetička sredina i standardna devijacija). Za utvrđivanje značajnosti razlika između grupa ispitanika primenjen je Studentov t - test za nezavisne uzorke ($p < 0.01$). Za sva izračunavanja korišten je aplikacijski statistički program SPSS za windows, 17.0.

Rezultati

Redovnost vannastavne fizičke aktivnosti u odnosu na razred i na pol ispitanika prikazana je u Tabeli 1.

Cardiorespiratory fitness is defined as the ability of the cardiovascular and respiratory systems to supply the oxygen to active muscles during continuous physical activity, that is, the body‘s ability to continuously perform movements of large muscle groups of moderate to high intensity. The high level of cardiorespiratory fitness in childhood and adolescence is associated with the health of the cardiovascular system during these years (Mesa et al., 2006a, b), and later in life (Ruiz et al., 2006a, b). Cardiorespiratory fitness is the most commonly identified with the aerobic capacity, i.e., maximal oxygen consumption (VO_{2max}), which is expressed in l/min, ml/kg/min or MET’s. The most important symptom of hypokinesia is precisely the reduction of aerobic ability (Čizmić, 1992; Saltin & Rowel, 1980).

The main research problem was to determine the elements of Health related physical fitness (cardiorespiratory fitness) of school children, which can be used as an evaluation of the physical education curriculum.

Method

The sample consisted of 333 schoolchildren (156 boys and 177 girls), older school age from 5th to 8th grade primary school in the city of Novi Sad.

As a criterion, we used the variable (for analysis of respondents groups) that was obtained by the survey: Regular exercise - with 3 answers: almost never (once a week or never), often (2-3 times a week) and always (more than 3 times per week).

To assess the morphological status, three variables were used: TELVIS - height, TELMAS - body weight and BMI - body mass index. For anthropometric measurement, International Biological Program (Weiner &Lourie, 1969) was used. BMI is obtained by the formula (kg/m2=weight (kg)/height (m))^2, a classification of children was done according to the values of overweight and obesity in children and adolescents (Cole, Bellizzi, Flegel & Dietz, 2000). To assess cardiovascular fitness SHUTTLE (Shuttle run test) (Eurofit, 1993) was used. Analyses were performed by sex (boys/girls), school grades and extracurricular physical activities.

For all results descriptive statistical parameters (mean and standard deviation) were calculated. To determine the significance of differences between groups of patients a Student t - test for independent samples was applied ($p <0.01$). For all calculations statistical program SPSS for Windows 17.0 was used.

Results

Regularity of extracurricular physical activity in relation to class and gender of respondents is shown in

Ispitanici 5-og razreda su najmanje uključeni u vannastavnu fizičku aktivnost, dok učešće sa godinama raste iz razreda u razred, kao i da su učenici aktivniji u odnosu na učenice.

Tabela 1. *Redovnost vannastavne fizičke aktivnosti učenika i učenica*

Uzrast / Class	Dečaci / Boys	Devojčice / Girls
5. razred / 5th grade	1.33	1.27
6. razred / 6th grade	2.33	2.30
7. razred / 7th grade	2.33	2.31
8. razred / 8th grade	2.73	2.47

Gotovo nikad (1 bod); Često (2 boda); Uvek (3 boda)

U tabeli 2 i 3 prikazane su morfološke karakteristike, vrednosti indeksa telesne težine i procenat gojaznih u odnosu na grupe (prema učešću u vannastavnim fizičkim aktivnostima).

Tabela 2. *Morfološke karakteristike učenika*

	Dečaci / Boys			
Uzrast / Age	**TELVIS**	**TELMAS**	**BMI**	**Gojazni / Obesity**
11 godNA (n=13) / 11 yearsNA (n=13)	1.50±0.08*	42.8±7.3	19.02±2.39	6.2%
11 godFA (n=27) / 11 yearsPA (n=27)	1.49±0.07	47.8±5.3	21.46±2.55	1.4%
12 god NA (n=27) / 12 years NA (n=27)	1.66±0.01	48.5±11.5	19.03±2.68	5.2%
12 godFA (n=18) / 12 yearsPA (n=18)	1.65±0.01	50.9±11.1	19.61±2.78	-
13 god NA (n=11) / 13 years NA (n=11)	1.70±0.02	64.0±6.5	22.10±2.29	6.2%
13 godFA (n=17) / 13 yearsPA (n=17)	1.70±0.07	56.5±5.8	20.73±1.74	-
14 god NA (n=18) / 14 years NA (n=18)	1.69±0.05	57.2±10.8	20.82±2.13	5.5%
14 godFA (n=25) / 14 yearsPA (n=25)	1.71±0.06	58.6±5.7	20.03±0.78	1.2%

** Aritmetička sredina – standardna devijacija*

Kod učenika koji nisu fizički aktivni vrednosti indeksa telesne mase su povišene i u tim grupama je zastupljen veći procenat gojaznih. Procenat gojaznih kod fizički neaktivnih kreće se od 5,2 – 6,2%, dok je kod fizički aktivnih učenika 1,2-1,4%.

Tabela 3. *Morfološke karakteristike devojčica*

	Devojčice / Girls			
Uzrast	**TELVIS**	**TELMAS**	**BMI**	**Gojazni / Obesity**
11 godNA (n=13) / 11 yearsNA (n=13)	1.57±0.11	43.4±4.9	19.70±1.96	5.5%
11 godFA (n=33) / 11 yearsPA (n=33)	1.53±0.11	46.2±8.6	19.48±2.63	1.7%
12 god NA (n=15) / 12 years NA (n=15)	1.50±0.05	45.5±0.1	20.05±1.35	3.4%

Table 1. Respondents of 5th grade are least involved in extracurricular physical activity, and participation increases with age from grade to grade, and boys are more active than girls.

Table 1. *Regularity of extracurricular physical activity of pupils*

Almost never (1 point); often (2 point); always (3 points)

Table 2 and 3 shows the morphological characteristics, body mass index and obesity rates in relation to the analyzed groups (by participation in extracurricular physical activities).

Table 2. *Morphological characteristics of boys*

** Arithmetic mean - Standard deviation*

For boys who are less physically active, body mass index was increased, and in these groups higher percentage of obese was noticed. Obesity in physically non-active varies from 5.2 - 6.2%, while the physically active boys is 1.2-1.4%.

Table 3. *Morphological characteristics of girls*

12 godFA (n=36) / 12 yearsPA (n=36)	1.59±0.10	50.9±8.2	20.18±2.58	0.7%
13 god NA (n=12) / 13 years NA (n=12)	1.69±0.05	61.3±2.5	22.34±1.82	4.2%
13 godFA (n=19) / 13 yearsPA (n=19)	1.70±0.01	55.5±4.5	19.35±1.45	1.5%
14 god NA (n=20) / 14 years NA (n=20)	1.68±0.04	52.7±5.1	22.55±1.48	6.7%
14 godFA (n=25) / 14 yearsPA (n=25)	1.70±0.06	53.3±1.5	21.99±2.39	2.1%

Može se zaključiti da su kod učenica koji nisu fizički aktivne, vrednosti indeksa telesne mase povišene i zastupljen je veći procenat gojaznih, baš kao i kod učenika. Kod učenica u svim analiziranim grupama zabeležena je gojaznost, bez obzira da li su ili nisu fizički aktivne, procenat gojaznih kod fizički neaktivnih kreće se od 3,4 – 6,7%, dok je kod fizički aktivnih učenica 0,7-2,1%.

U tabeli 4 prikazane su vrednosti kardiorespiratorne forme ($VO_{2\ max}$) za uzorak ispitanika i rezultati Studentovog t testa.

It can be concluded that girls who are not physically active, have higher body mass index value and higher percentage of obese, as well as boys. In all analyzed groups (girls) obesity was observed, whether they are physically active or not. Obesity rates in physically inactive vary from 3.4 - 6.7%, while in physically active schoolgirls ranged from 0.7-2.1%.

Table 4 shows the cardiorespiratory fitness (VO_{2max}) for the sample of children and the results of the Student t test.

Tabela 4.*Vrednosti* *$VO_{2\ max}$ prema godinama i polu*

Table 4. *Values of $VO_{2\ max}$ by age and gender*

Maksimalna potrošnja kiseonika VO2 max (ml/kg^{-1}.min^{-1}) / Maximal oxygen consumption $VO_{2\ max}$ (ml/kg^{-1}.min^{-1})						
	Dečaci / Boys			Devojčice / Girls		
Uzrast / Age	NA	FA	p	NA	FA	p
11 god. / years	37.42±3.81*	45.76±8.47	**0.000**	33.46±1.67	34.12±2.55	0.371
12 god. / years	34.58±4.19	39.29±4.61	**0.003**	32.85±2.85	37.18±4.73	**0.008**
13 god. / years	33.44±5.42	42.50±6.39	**0.000**	37.87±1.72	46.61±1.48	**0.001**
14 god. / years	27.56±5.16	32.81±3.79	**0.003**	32.24±4.56	36.52±4.34	**0.009**

$VO_{2\ max}$ – maksimalna potrošnja kiseonika
NA – fizički neaktivni; FA – fizički aktivni
**Aritmetička sredina standardna devijacija*
p – Rezultati Studentovog t-testa za nezavisne uzorke (p < 0.01)

$VO_{2\ max}$ – maximal oxygen consumption
NA – non active; PA – physically active
**Arithmetic mean - Standard deviation*
p – Results of the Student t test (p < 0.01)

Osim kod učenica petog razreda, između svih ostalih grupa ispitanika, zabeležena je statistički značajna razlika u odnosu na vrednosti kardirespiratorne forme, u korist ispitanika koji su imali vannastavnu fizičku aktivnost.

Except for a 5th grade girls, among all other groups of children there was statistically significant difference compared to the values of cardiorespiratory fitness in favor of children who had extracurricular physical activity.

Diskusija

Prema normativima vrednosti VO_{2max} za uzrast 10-14 godina (Karila, Blic, Waerbessyckle, Bernoist i Scheinmann, 2001), svi zabeleženi rezultati učenika koji nisu fizički aktivni nalaze se u zoni veoma slabih rezultata. I kod fizički aktivnih učenika, rezultati su rangirani kao prosečni (5. razred), slabi (6. i 7. razred) i veoma slabi kada su u pitanju učenici 8. razreda. Kod učenica, veoma slabi rezultati zabeleženi su kod uzrasta 6. i 8. razreda koje nisu fizički aktivne, slabi rezultati u 5. razredu i do-

Discussion

According to the norms of VO_{2max} for ages 10-14 years (Karila, Blic, Waerbessyckle, Bernoist & Scheinmann, 2001), all observed results of the pupils which are less physically active are in the zone of very weak results. And in physically active pupils, the results were ranked as regular (5th grade), weak (6th and 7th grade) and very weak when it comes to 8th grade pupils.

For schoolgirls very weak results were observed in aged 6th and 8th grade, for those which are not physically

bri rezultati u 7. razredu. Učenice koje su fizički aktivne zabeležile su odlične rezultate u 7. razredu, prosečne rezultate u 6. i 8. razredu i slabe rezultate u 5. razredu. I na osnovu testiranja učenika osnovnih škola u Srbiji (Gajević, 2009) u ispoljenim motoričkim i funkcionalnim sposobnostima zaostajemo za prosekom školske populacije zemalja EU. Nažalost, rezultati i ove studije se uklapaju u trend da se broj mladih koji se bave fizičkom aktivnošću smanjuje (Brooks i Magnusson, 2006). Činjenice da su učenici aktivniji u odnosu na učenice, ukazuju da postojeća nastavna praksa ne izlazi u susret specifičnim potrebama i afinitetima devojčica (Đorđić i Tumin, 2008). Dečaci predstavljaju homogeniju grupu, kad je reč o percepciji različitih aspekata fizičkog vaspitanja (vannastavnoj fizičkoj aktivnosti). Jedan od mogućih uzroka, neaktivnosti je kvalitet nastave fizičkog vaspitanja, sa relativno malim brojem aktivnosti i orijentacijom na sportska takmičenja i sticanje motoričkih znanja (Hardman, 2008; 2007). Fizičko vaspitanje treba da omogući učenicima da steknu značajan deo preporučene dnevne doze fizičke aktivnosti, ali i znanja o važnosti iste za ceo život (Scruggs i sar., 2003). Nastavnik je ključni faktor motivacije učenika i promovisanja fizičke aktivnosti, te su učenici koji su zadovoljni na časovima fizičkog vaspitanja, mnogo aktivniji fizički van škole (Vilhjamsson i Thorlindsson, 1998). Za poboljšanje fizičke forme dece, potrebna je i edukacija odraslih (roditelja), jer od njihovih stavova prema vežbanju zavisi i učešće njihove dece (Mikalački, Čokorilo i Pantelić, 2006; Tubić, 2006). Američka nacionalna asocijacija za sport i fizičko vežbanje, predlaže svakodnevno fizičko vežbanje u trajanju od 45 minuta za više razrede i srednju školu kumulativno kroz časove fizičkog vaspitanja i sve druge oblike dnevnih aktivnosti. Fizički aktivna deca su manje sklona hroničnim oboljenjima (Casparsen, Nixon i DuRant, 1998), metaboličkim problemima (Moore, Nguyen, Rothman, Cupples i Ellison, 1995), a postoji i velika mogućnost da u odraslom dobu budu fizički aktivna (Malina, 1996). Aktivan način života i svakodnevna fizička aktivnost ima značajnu ulogu u prevenciji nastanka gojaznosti (DiPietro, 1999). Posebno je ugrožena populacija neaktivnih devojčica, koje imaju jaču povezanost između gojaznosti i kardivaskularnih oboljenja (Burke i sar., 2005).

Praćenje i kontrola kardiovaskularne forme je od izuzetne važnosti kroz ceo život (Malina, 1996) zbog povezanosti sa rizikom od kardivaskularnih oboljenja i gojaznosti (Ostojić, Stojanović, Stojanović, Marić i Njaradi, 2011; Ruiz, Rizzo, Wennlof, Ortega, Harro i Sjostrom, 2006). Takođe, kardiovaskularna forma u periodu detinjstva je povezana sa povećanim rizikom od gojaactive, weak results in the 5th grade and good results in 7th grade. Schoolgirls which are physically active have obtained excellent results in 7th grade, regular results in 6th and 8th grade and weak results in the 5th grade. The results of motor and functional abilities tests of children of primary schools in Serbia (Gajević, 2009) are inferior when compared to the average school population in EU countries. Unfortunately, the results of this study fit into the trend that the number of young people who are engaged in physical activity decreases (Brooks & Magnusson, 2006). The fact that boys are more active, indicate that the existing teaching practice does not meet the specific needs and preferences of girls (Đorđić & Tumin, 2008).

Boys are more homogeneous group when it comes to perceptions of various aspects of physical education (extracurricular physical activity). One of the possible causes of inactivity is the quality of physical education classes, with a relatively small number of activities and orientation in sports competitions and development of motor skills (Hardman, 2008; 2007).

Physical education should enable pupils to gain significant load of recommended daily physical activity, but also and knowledge about the importance of the same for the entire life (Scruggs et al., 2003). The teacher is a key factor in pupil's motivation and promotion of physical activity, and pupils who are satisfied in physical education classes, are more physically active outside of school (Vilhjamsson & Thorlindsson, 1998).

To improve the physical fitness of children, education of adults (parents) is needed because participation of their children is depended on their attitudes to physical activity (Mikalački, Čokorilo & Pantelić, 2006; Tubić, 2006). The US National Association for Sport and physical exercise suggests 45 minutes of physical activity daily for higher grades and high school children, cumulative through physical education classes and all other forms of daily activities. Physically active children are less prone to chronic diseases (Casparsen, Nixon & DuRant, 1998), metabolic problems (Moore, Nguyen, Rothman, Cupples & Ellison, 1995), and there is a strong possibility that, in adulthood, they will be physically active (Malina, 1996). Active lifestyle and daily physical activity plays an important role in the prevention of obesity (DiPietro, 1999). Particularly vulnerable is population of inactive girls, who have a strong correlation between obesity and cardiovascular disease (Burke et al., 2005).

Monitoring and control of cardiovascular fitness is essential for the whole life (Malina, 1996), because of its association with the risk of cardiovascular disease and obesity (Ostojić, Stojanović, Stojanović, Marić & Njaradi,

znosti i drugim metaboličkim poremećajima u odraslom periodu (Dwyer i sar., 2009; Cleland, Dwyer i Venn, 2008; Ferreira, Twisk, Stehouwer, Van Mechelen i Kemper, 2003). Kod dece, niži nivo fizičke forme povezan je sa umanjenim kognitivnim funkcijama koje zahtevaju pažnju, pamćenje i kognitivnu kontrolu (Kamijo i sar., 2012a; Hillman, Buck, Themanson, Pontifex i Castelli, 2009), kao i sa umanjenim ostvarenjima u učenju (Kamijo i sar., 2012b; Castelli i sar., 2003).

Zaključak

Učenici petih razreda, su najmanje uključeni u vannastavnu fizičku aktivnost, dok su učenici su aktivniji u odnosu na učenice. Učenici koji nisu fizički aktivni imaju povišene vrednosti indeksa telesne mase, i zastupljen veći procenat gojaznih. Kod učenica, u svim analiziranim grupama zabeležena je gojaznost, bez obzira na vannastavnu fizičku aktivnost. Osim kod učenica petog razreda, između svih ostalih grupa ispitanika, zabeležena je statistički značajna razlika u odnosu na vrednosti kardiorespiratorne forme, u korist ispitanika koji su imali vannastavnu fizičku aktivnost. Svi zabeleženi rezultati su uglavnom ispod nivoa dobrih u odnosu na optimalne kriterijume za ovaj uzrast.

Praćenje parametara fizičke forme povezane sa zdravljem treba da postane praksa od polaska dece u školu, kako bi se na vreme moglo uticati na nepovoljne faktore koji mogu ugroziti zdravlje, i iskoristili benefiti fizičke aktivnosti.

Izjava autora
Autori pridonijeli jednako.

Konflikt interesa
Mi izjavljujemo da nemamo konflikt interesa.

2011; Ruiz, Rizzo, Wennlof, Ortega, Harro & Sjostrom, 2006)). Also, cardiovascular fitness in period of childhood is related with an increased risk of obesity and other metabolic disorders in adulthood (Dwyer et al., 2009; Cleland, Dwyer& Venn, 2008; Ferreira, Twisk, Stehouwer, Van Mechelen & Kemper, 2003). In children, lower levels of physical fitness is associated with reduced cognitive functions that require attention, memory and cognitive control (Kamijo et al., 2012a; Hillman et al., 2009), and diminished achievements in learning (Kamijo et al., 2012b; Castelli et al. 2003).

Conclusion

Fifth grade pupils are least involved in extracurricular physical activity and boys are more active than girls. Schoolchildren which are less physically active have higher values of body mass index, and higher percentage of obese. For schoolgirls, in all analyzed groups obesity was observed, regardless of extracurricular physical activity. Except for a fifth grader, among all other groups of children there was statistically significant difference compared to the values of cardiorespiratory fitness in favor of the respondents who had extracurricular physical activity. All results observed are generally below the level of good as compared to the optimum norms for this age group.

Monitoring parameters of health related physical fitness should become common practice since the start of the school in order to affect the unfavorable factors, that may threaten the health, and to use the benefits of physical activity.

Authorship statement
The authors have contributed equally.

Financial disclosure
We declare that we have no confl icts of interest.

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Primljen: 26. novembar 2014. / Received: November 26, 2014
Prihvaćen: 14. decembar 2014. / Accepted: December 14, 2014