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## VREME PROVEDENO PRED EKRANOM I UČEŠĆE U SPORTU VAN NASTAVE MEĐU DECOM LOKALNE ZAJEDNICE U SRBIJI

Vesna Petrović (1), Tanja Rožek Mitrović (1), Radmila Erceg-Javor (2)

(1) PRIMARNI ZDRAVSTVENI CENTAR „DR MILORAD MIKA PAVLOVIĆ“, INĐIJA, SRBIJA; (2) SPECIJALNA BOLNICA ZA NEUROLOŠKA OBOLJENJA I POSTTRAUMATSKA STANJA „DR BORIVOJE GNJATIĆ“, SRBIJA

**SAŽETAK: Uvod:** Postoje dokazi da su viši nivoi vremena provedenog pred ekranom povezani sa negativnim efektima po zdravlje dece. S druge strane, količina fizičke aktivnosti veća od 60 minuta pruža dodatne zdravstvene koristi. Cilj naše studije bio je upoređivanje dužine vremena provedenog pred ekranom i učešća u sportskim aktivnostima van nastave između dve grupe adolescenata u Indiji. **Materijal i metode:** Ispitivanje je sprovedeno kao studija preseka u Domu zdravlja u Indiji. Učestvovalo je 200 učenika, od kojih je 100 učenika petog razreda osnovne škole i 100 učenika prvog razreda srednje škole. Podaci su prikupljeni upitnikom koji je kreiran u svrhu studije. **Rezultati:** U našoj studiji učestvovalo je 200 učenika, 41% su bili dečaci. Učenici srednjih škola nisu poštovali preporuke za vreme provedeno pred ekranom znatno više nego osnovnoškolci, kako radnim danom ( $\chi^2 = 28,06$ ,  $p < 0,01$ ) tako i vikendom ( $\chi^2 = 40,996$ ,  $p < 0,01$ ). Učenici osnovnih škola znatno su više učestvovali u sportu van nastave nego srednjoškolci ( $\chi^2 = 5,225$ ,  $p < 0,05$ ). Dečaci srednjoškolci znatno su više učestvovali u sportu van nastave od srednjoškolki ( $\chi^2 = 16,234$ ,  $p < 0,01$ ) i devojčice iz osnovnih škola znatno više od srednjoškolki takođe ( $\chi^2 = 7,966$ ,  $p < 0,05$ ). **Zaključak:** Ova studija je pokazala da više od polovine učenika u Indiji ne ispunjava preporuke za vreme provedeno pred ekranom radnim danom i vikendom, srednjoškolci značajno više od osnovnoškolaca. Oko četrdeset procenata dece ne učestvuje u sportskim aktivnostima van nastave. Učenici osnovnih škola učestvuju značajno više u sportskim aktivnostima van nastave nego učenici srednjih škola, sa značajnim padom kod srednjoškolki.

**Ključne reči:** adolescenti; sedentarne navike; digitalni mediji; vreme provedeno pred ekranom (screen time); sportske aktivnosti van nastave; fizička aktivnost

### UVOD

Nezavisno od nivoa fizičke aktivnosti, sedentarno ponašanje povezano je sa povećanim rizikom od kardio-metaboličkih bolesti, smrtnosti od svih uzroka i raznih fizioloških i psiholoških problema [1]. Pitanje vremena provedenog pred ekranom za decu koja provode vreme on-line, iako se još uvek raspravlja, zastarelo je. To je zato što ne postoji jasan dogovor o tome kada se vreme provedeno na digitalnoj tehnologiji prebacuje sa umerenog na preterano; „Koliko je previše“ vrlo je individualno i zavisi od dečijeg uzrasta, individualnih karakteristika i šireg životnog konteksta [2]. Američka akademija za pedijatriju preporučila je deci i tinejdžerima ne više od dva sata pred ekranom za vanškolske aktivnosti [3], ali deca i omladina provode više od 7 sati dnevno koristeći medije, a velika većina njih ima pristup televiziji u spavaćoj sobi, računaru, internetu, konzoli za video igre i mobilnom telefonu [4]. Postoje dokazi da je više vremena pred ekranom

povezano sa raznim negativnim efektima na zdravlje dece i omladine, a najjači su dokazi o prekomernoj i nezdravoj ishrani, depresivnim simptomima i kvalitetu života [5]. Nedavni dokazi izazivaju zabrinutost zbog uticaja medija na agresiju, seksualno ponašanje, upotrebu droga, neredovnu ishranu i poteškoće u učenju [3].

Da bi poboljšali kardiorespiratornu i mišićnu kondiciju, zdravlje kostiju i kardiovaskularne i metaboličke zdravstvene biomarkere, deca uzrasta od 5 do 17 godina trebalo bi da akumuliraju najmanje 60 minuta fizičke aktivnosti umerenog do jakog intenziteta dnevno [6]. Jedan od dobrovoljnih globalnih ciljeva za prevenciju i kontrolu nezaznih bolesti koje treba postići do 2025. godine je 10% relativnog smanjenja učestalosti nedovoljne fizičke aktivnosti [7].

Cilj naše studije bio je upoređivanje dužine vremena provedenog pred ekranom i učešća u sportskim aktivnostima van nastave između dve grupe adolescenata u Indiji.

## SCREEN TIME AND EXTRACURRICULAR SPORTS PARTICIPATION AMONG CHILDREN IN A LOCAL COMMUNITY IN SERBIA

Vesna Petrović (1), Tanja Rožek Mitrović (1), Radmila Erceg-Javor (2)

(1) PRIMARY HEALTH CARE CENTER "DR MILORAD MIKA PAVLOVIC", INĐIJA, SERBIA; (2) SPECIAL HOSPITAL FOR NEUROLOGICAL DISEASES AND POSTTRAUMATIC CONDITIONS "DR BORIVOJE GNJATIC", SERBIA

**SUMMARY: Introduction:** There is evidence that higher levels of screen time are associated with various negative effects on children's health. On the other hand, amounts of physical activity greater than 60 minutes provide additional health benefits. The aim of our study was to compare screen time and participation in extracurricular sports activities between two groups of adolescents in Indija. **Materials and methods:** A cross-sectional study was conducted in a Primary Healthcare Center Indija. 200 students participated, of which 100 fifth grade elementary school students and 100 first grade secondary school students. Data were collected by means of a questionnaire, which was designed for this study. **Results:** In our study 200 of students participated, of which 41% were boys. Secondary school students ignored the recommendations for daily screen time significantly more than elementary school students, on workdays ( $\chi^2=28.06$ ,  $p<0.01$ ), and at weekends ( $\chi^2=40.996$ ,  $p<0.01$ ). Elementary school students participated in extracurricular sports significantly more than secondary school students ( $\chi^2=5.225$ ,  $p<0.05$ ). High school boys participated in extracurricular sports considerably more than high school girls ( $\chi^2=16.234$ ,  $p<0.01$ ), and elementary school girls also participated more than high school girls ( $\chi^2=7.966$ ,  $p<0.05$ ). **Conclusion:** This research showed that more than half of the students in Indija ignored the recommendations for screen time on workdays and at weekends, high school students considerably more than elementary school students. Approximately forty percents of the students did not participate in extracurricular sports. Elementary school students participate in extracurricular activities significantly more than secondary school students, with significant decline in high school girls.

**Keywords:** adolescents; sedentary habits; digital media; screen time; extracurricular sports activities; physical activity

### INTRODUCTION

Independent of physical activity levels, sedentary habits are associated with increased risk of cardio-metabolic disease, all-cause mortality, and a variety of physiological and psychological problems [1]. The issue of screen time for children being online, while still debated, is out-of-date. This is because there is no clear agreement on when the time spent on digital technology goes from moderate to excessive; 'how much is too much' is highly individual, depends on the child's age, individual characteristics and broader life context [2]. The American Academy of Pediatrics has recommended no more than two hours of screen time for children and teenagers for extracurricular activities [3]. But children and youth spend more than 7 h per day using media; the vast majority of them have access to television in the bedroom, access to a computer,

the Internet, a video-game console, and a cell phone [4]. There is evidence that higher levels of screen time are associated with various negative effects on the health of children and youth, with the evidence for adiposity, unhealthy diet, depressive symptoms and quality of life being the strongest [5]. Recent evidence raises concerns about media's effects on aggression, sexual behavior, substance use, disordered eating, and academic difficulties [3]. In order to improve cardiorespiratory and muscular fitness, bone health, and cardiovascular and metabolic health biomarkers of children, those aged 5-17 should accumulate at least 60 minutes of moderate- to vigorous-intensity physical activity daily [6]. One of the voluntary global targets for prevention and control of non-infectious diseases to be attained by 2025 is 10% relative reduction in prevalence of insufficient physical activity [7].

### MATERIJAL I METODE

Studija je sprovedena kao studija preseka u Domu zdravlja „Dr Milorad Mika Pavlović“ u Indiji, u periodu od septembra 2018. do septembra 2019. godine. Indija je grad i opština koja se nalazi u sremskom okrugu autonomne pokrajine Vojvodine, Srbija. Od 2011. godine u gradu živi 26.025 stanovnika, dok opština ima 47.433 stanovnika [8]. Pedijatrijsko odeljenje Doma zdravlja imalo je oko 6870 medicinskih kartona dece u uzrastu od 1. do 18. godine u periodu ispitivanja.

Učestvovanje u studiji je bilo dobrovoljno. Učestvovalo je 200 učenika, 100 učenika petog razreda osnovne škole i 100 učenika prvog razreda srednje škole. Podaci su prikupljeni upitnikom koji je kreiran u svrhu studije. Učesnici su popunili upitnik kada su bili na pregledu kod pedijatra. Deca petog razreda bila su sa roditeljima (mlađi od petnaest godina) koji su dali pristanak za učešće. Deca prvog razreda srednje škole učestvovala su vlastitim pristankom.

Smatrali smo da ne ispunjava preporuke vreme provedeno pred ekranom na dan za vanškolske aktivnosti koje je veće od 2 sata. Učenici koji su se bavili sportom van nastave duže od šest meseci pre početka ispitivanja smatrali su se učesnicima u sportu.

Rezultati su predstavljeni metodom deskriptivne statistike, a razlike između grupa su izračunate

pomoću hi-kvadrat testa. P-vrednost od <0,05 se smatrala značajnom.

### REZULTATI

Od svih 200 učesnika 118 (59%) su bile devojčice, a 82 (41%) dečaci. U grupi učenika osnovne škole 56%, a u grupi srednjih škola 62% su bile devojčice. Ispitivane grupe se nisu značajno razlikovale po polu. Prosečna starost u grupi osnovnoškolaca bila je 10,64, a u grupi srednjoškolaca 14,76.

Preporuku za vreme provedeno pred ekranom radnim danom nije ispunilo 115 (57,5%) učesnika, a vikendom 111 (55,5%). Vreme provedeno pred ekranom među srednjoškolcima i osnovnoškolcima prikazano je u Tabeli 1. i Tabeli 2. Polne razlike i razlike između radnog dana i vikenda po pitanju dužine vremena provedenog pred ekranom u obe grupe pojedinačno nisu dostigle statističku značajnost. Srednjoškolci su bili značajno više vremena pred ekranom (> 2h dnevno) za vanškolske aktivnosti kako radnim danom ( $\chi^2=28.06$ ,  $p<0.01$ ), tako i vikendom ( $\chi^2=40.996$ ,  $p<0.01$ ) nego osnovnoškolci. Srednjoškolke su bile više vremena pred ekranom nego devojčice u osnovnim školama kako radnim danom ( $\chi^2=15.246$ ,  $p<0.01$ ), tako i vikendom ( $\chi^2=10.384$ ,  $p<0.01$ ). Dečaci srednjoškolci bili su više pred ekranom nego dečaci iz osnovnih škola kako radnim danom ( $\chi^2=15,5$ ,  $p<0,01$ ), tako i vikendom ( $\chi^2=21,5$ ,  $p<0,01$ ).

Tabela 1. Vreme provedeno pred ekranom na dan-srednjoškolci

Vreme provedeno pred ekranom	< 2h		2h		Ukupno N
	N	%	N	%	
Radni dan	24	24.0	76	76.0	100
Vikend	22	22.0	78	78.0	100
Radni dan devojčice	16	28.6	40	71.4	56
Radni dan dečaci	8	18.2	36	81.8	44
Vikend devojčice	16	28.6	40	71.4	56
Vikend dečaci	6	13.6	38	86.4	44

The aim of our study was to compare screen time and participation in sports activities between two groups of adolescents in Indija.

**METHODS**

**Study design and setting:** A cross-sectional study was conducted in Primary Healthcare Center “Dr Milorad Mika Pavlovic”, Indija in the period September 2018-September 2019. Indija is a town and a municipality located in the Srem District of the autonomous province of Vojvodina, Serbia. Per 2011 census, the town has the total population of 26,025, while the municipality has 47,433 inhabitants [8]. Primary HealthCare Centers’ Pediatric Department had approximately 6870 medical records of children aged 1-18 in the study period.

**Data collection and variables.** Participation in the study was voluntary. 200 students participated, of which 100 fifth grade elementary school students and 100 first grade secondary school students. Data were collected by means of a questionnaire, which was designed for this study. Participants filled the questionnaire when they were at the pediatrician examination. Fifth grade children (younger than fifteen) were with their parents who had given their consent for participation. First grade secondary school children consented to participate in the study. Daily screen time for extracurricular activities longer than 2 hours was considered ignoring the recommendations. Students who went in for extracurricular sport trainings for more than six months before the study started were considered sports participants.

**Statistical methods.** The results are presented by the method of descriptive statistics and the

differences between the groups were calculated by chi-square test. P-value of <0.05 was considered significant.

**RESULTS**

Out of all 200 participants, 118 (59%) were girls, and 82 (41%) were boys. In the elementary school students group 56% were girls, and in the secondary school students group 62% were girls. There were not significant gender differences between these two groups. Mean age in the group of elementary school students was 10.64, and in the group of secondary school students 14.76.

115 (57.5%) of all children on workdays and 111 (55.5%) at weekends ignored the recommendations for screen time. Daily screen time among secondary school and elementary school students is presented in Table 1 and Table 2. Gender differences and differences between screen time on workdays and at weekends in both groups individually did not reach statistical significance. Secondary school students spent significantly more time in front of screens (> 2h daily) for extracurricular activities both on workdays ( $\chi^2=28.06$ ,  $p<0.01$ ), and at weekends ( $\chi^2=40.996$ ,  $p<0.01$ ) than elementary school students. Secondary school girls spent more time in front of screens than elementary school girls both on workdays ( $\chi^2=15.246$ ,  $p<0.01$ ), and at weekends ( $\chi^2=10.384$ ,  $p<0.01$ ). Secondary school boys spent more time in front of screens than elementary school boys both on workdays ( $\chi^2=15.5$ ,  $p<0.01$ ), and at weekends ( $\chi^2=21.5$ ,  $p<0.01$ )

Table 1. Screenshot daily – secondary school students

Screen time secondary school	< 2h		> 2h		Total N
	N	%	N	%	
Workdays	24	24.0	76	76.0	100
Weekends	22	22.0	78	78.0	100
Workdays girls	16	28.6	40	71.4	56
Workdays boys	8	18.2	36	81.8	44
Weekends girls	16	28.6	40	71.4	56
Weekends boys	6	13.6	38	86.4	44

Tabela 2. Vreme provedeno pred ekranom na dan-osnovci

Vreme provedeno pred ekranom	< 2h		> 2h		Ukupno N
	N	%	N	%	
Radni dan	61	61.0	39	39.0	100
Vikend	67	67.0	33	33.0	100
Radni dan devojčice	40	64.5	22	35.5	62
Radni dan dečaci	23	60.5	15	39.5	38
Vikend devojčice	36	58.0	26	42.0	62
Vikend dečaci	24	63.2	14	36.8	38

Od svih učesnika 84 (42%), 50 (50%) srednjoškola i 34 (34%) učenika osnovnih škola nije učestvovalo u vannastavnim sportskim aktivnostima (Tabela 3 i Tabela 4). Dečaci srednjih škola znatno su više učestvovali u sportu van nastave od srednjoškolki ( $\chi^2=16.234$ ,  $p < 0.01$ ). Polne razlike u sportskom učešću učenika osnovne škole nisu dostigle statistički značaj.

Učenici osnovnih škola znatno su više učestvovali u vanškolskom sportu nego srednjoškola ( $\chi^2=5.225$ ,  $p < 0,05$ ). Devojčice iz osnovne škole značajno su više učestvovali u vanškolskom sportu nego devojčice iz srednjih škola ( $\chi^2=7.966$ ,  $p < 0,05$ ). Nije bilo značajne razlike u sportskom učešću između dečaka.

Tabela 3. Učešće u sportu van nastave - srednjoškola

Sport-srednjoškola	Da		Ne		Ukupno (N)
	N	%	N	%	
Ukupno	50	50.0	50	50.0	100
Devojčice	18	32.1	38	67.9	56
Dečaci	32	72.7	12	27.3	44

Tabela 4. Učešće u sportu van nastave - osnovci

Sport-osnovci	Da		Ne		Ukupno (N)
	N	%	N	%	
Ukupno	66	66.0	34	34.0	100
Devojčice	36	58.0	26	42.0	62
Dečaci	28	73.7	10	26.3	38

### DISKUSIJA

Upotreba računara, video igara i vlasništvo nad uređajima, poput tableta i pametnih telefona, javljaju se od sve mlađeg uzrasta. Vreme pred ekranom, posebno gledanje televizije, negativno je povezano sa razvojem fizičkih i kognitivnih

sposobnosti i pozitivno je povezano sa gojaznošću, problemima sa spavanjem, depresijom i anksioznošću [9]. Najnovija istraživanja Instituta za javno zdravlje Srbije pokazuju da 57,8% učenika u 5. i 7. razredu osnovne škole i 1. razredu srednje škole svakodnevno provodi više od dva sata dnevno

Table 2. Screentime daily - elementary school students

Screen time elementary school	< 2h		> 2h		Total N
	N	%	N	%	
Workdays	61	61.0	39	39.0	100
Weekends	67	67.0	33	33.0	100
Workdays girls	40	64.5	22	35.5	62
Workdays boys	23	60.5	15	39.5	38
Weekends girls	36	58.0	26	42.0	62
Weekends boys	24	63.2	14	36.8	38

Out of all participants, 84 (42%), 50 (50%) of secondary school students and 34 (34%) of elementary school students did not participate in extracurricular sports activities (Table 3 and Table 4). Secondary school boys participated in extracurricular sports considerably more than secondary school girls ( $\chi^2=16.234$ ,  $p<0.01$ ). Gender differences for extracurricular sports participation between elementary school

students did not reach statistical significance. Elementary school students participated significantly more in extracurricular sports than secondary school students ( $\chi^2=5.225$ ,  $p<0.05$ ). Elementary school girls participated in extracurricular sports considerably more than secondary school girls ( $\chi^2=7.966$ ,  $p<0.05$ ). There was no significant difference in sports participation between boys.

Table 3. Extracurricular sports participation - secondary school students

Sports- secondary school	Yes		No		Total (N)
	N	%	N	%	
All	50	50.0	50	50.0	100
Girls	18	32.1	38	67.9	56
Boys	32	72.7	12	27.3	44

Table 4. Extracurricular sports participation - elementary school students

Sports- elementary school	Yes		No		Total (N)
	N	%	N	%	
All	66	66.0	34	34.0	100
Girls	36	58.0	26	42.0	62
Boys	28	73.7	10	26.3	38

### DISCUSSION

Computer use, video games and ownership of devices, such as tablets and smart phones, occurs at an increasingly young age. Screen time, television viewing, in particular, has been negatively associated with the development of physical and cognitive abilities, and positively associated with obesity, sleeping problems, depression and anxiety [9]. Recent research by

the Institute of Public Health of Serbia shows that 57.8% of students in the 5th, 7th grade of elementary school and the 1st grade of secondary school spend more than two hours a day watching television on weekdays. There is a significantly higher percentage of boys of the same age, who play games for more than two hours a day during weekdays and at weekends [10]. In our study no significant gender

gledajući televiziju. Postoji značajno veći procenat dečaka iste dobi koji tokom radnog dana i vikenda igraju igrice duže od dva sata dnevno [1]. U našoj studiji nije bilo značajnih polnih razlika u obe grupe pojedinačno, 5. razred osnovne škole i 1. razred srednjoškola po pitanju dužine vremena provedenog pred ekranom. Učenici srednjih škola nisu poštovali preporuke za vreme provedeno pred ekranom znatno više nego učenici osnovnih škola, i razlike u polovima između učenika osnovnih i srednjih škola po pitanju vremena pred ekranom su dostigle statistički značaj.

Fizička aktivnost i indeks telesne mase snažno su povezani od detinjstva do odrasle dobi, odnos je s godinama sve veći i zato je važno uspostaviti zdrave navike kako bi se gojaznost sprečila u kasnijem životu. Studije su pokazale da fizička aktivnost, sport i učešće u sportskim takmičenjima opadaju tokom adolescencije, posebno kod devojčica [11]. Dok nivo fizičke aktivnosti drastično opada tokom adolescencije, stope izloženosti ekranu tokom vremena znatno se povećavaju [12]. Naše istraživanje pokazuje da u ispitivanim grupama učenici osnovnih škola učestvuju u vanškolskim sportskim aktivnostima znatno više od srednjoškolaca, a značajan je pad kod srednjoškolki.

Promovisanje fizičke aktivnosti i zdrave ishrane može biti dobra strategija od pukog smanjenja vremena provedenog pred ekranom da bi se smanjili štetni efekti na zdravlje dece i omladine. Neka istraživanja pokazala su da roditeljska pravila u vezi sa vremenom izloženosti ekranu i učešćem u fizičkoj aktivnosti igraju ulogu u količini vremena provedenog pred ekranom među decom i adolescentima, zaključujući da programi koji podstiču postavljanje ograničenja od strane roditelja i promovišu fizičku aktivnost mogu smanjiti vreme provedeno pred ekranom među mladima [13]. Vreme provedeno pred ekranom takođe je povezano sa lošom vezanošću za roditelje i vršnjake kod adolescenata [14].

Stoga anticipativne smernice za zdrave promene u ponašanju treba da budu usredsređene na porodicu. Roditelji bi trebalo da prepoznaju i razumeju vlastitu ulogu u modeliranju odgovarajuće upotrebe raznih medija i ravnoteže između vremena provedenog pred ekranom i drugih aktivnosti [15]. Da bi se maksimizirale zdravstvene koristi, pristupi za rešavanje krize neaktivnosti trebalo bi da pokušaju da povećaju namernu fizičku aktivnost i smanje sedentarno ponašanje, posebno u pedijatrijskoj populaciji [16].

Bilo je nekoliko ograničenja koja treba uzeti u obzir u tumačenju ovih rezultata. Naše podatke smo prikupili upitnikom koji je kreiran u svrhu studije, ali naše rezultate je bilo lako protumačiti i uporediti sa drugim studijama. Imamo i umeren ali uravnotežen uzorak ove dve grupe učenika. U prvi mah snage naše studije mogle bi se razmotriti kroz istraživački rad u primarnoj zdravstvenoj zaštiti. Metoda ove studije mogla bi biti osnova za veće studije sa više učesnika.

#### ZAKLJUČAK

Ova studija je pokazala da više od polovine učenika u Indiji ne ispunjava preporuke za vreme provedeno pred ekranom radnim danom i vikendom, srednjoškolci značajno više od osnovnoškolaca. Oko četrdeset procenata dece ne učestvuje u sportskim aktivnostima van nastave. Učenici osnovnih škola učestvuju značajno više u sportskim aktivnostima van nastave nego učenici srednjih škola, sa značajnim padom kod srednjoškolki. Uбудuće bi se neki javni programi trebali usredsrediti na učenike između ove dve grupe (od 5. do 8. razreda osnovne škole) kako bi se sprečio pad sportskih aktivnosti među srednjoškolcima i, samim tim, prevenirao porast vremena provedenog pred ekranom.

sukob interesa: ne postoji

#### LITERATURA:

1. Katzmarzyk PT, Church TS, Craig CL, Bouchard C. Sitting time and mortality from all causes, cardiovascular disease, and cancer. *Med Sci Sports Exerc.* 2009; 41(5): 998-1005. doi:10.1249/MSS.0b013e3181930355
2. UNICEF. The State of the world's children 2017. Children in a Digital World. 2017.
3. Strasburger VC, Hogan MJ, Mulligan DA, Ameenuddin N, Christakis DA, Cross C, et al. Children, adolescents, and the media. *Pediatrics.* 2013; 132(5): 958-61.
4. Strasburger VC, Jordan AB, Donnerstein E. Health effects of media on children and adolescents. *Pediatrics.* 2010; 125(4): 756-767. doi:10.1542/peds.2009-2563
5. Stiglic N, Viner RM. Effects of screentime on the health and well-being of children and adolescents: a systematic review of reviews. *BMJ Open.*

differences were present in both groups individually, 5th grade of elementary school and the 1st grade of secondary school children, across screen time per day. But secondary school students ignored the recommendations for daily screen time significantly more than elementary school students, gender differences between elementary and secondary school students did reach statistical significance.

Physical activity and body mass index are strongly linked from childhood to adulthood, the relationship between these gets increasingly higher with age and therefore it is important to establish healthy habits early to prevent obesity in later life. Studies have shown that physical activity, sports and participation in sports competitions decline during adolescence, especially in girls [11]. While physical activity levels decline drastically during adolescence, levels of screen time increase considerably [12]. Our research shows that in our two groups elementary school students participate in extracurricular sports activities significantly more than secondary school students, with a significant decline in secondary school girls.

Promoting physical activity and a healthy diet might prove a better strategy than merely reducing screen time to decrease harmful effects of screen time on the health of children and youth. Some studies have shown that parental rules regarding screen time and participation in physical activity play a role in the amount of screen time among children and adolescents, concluding that programs that encourage limit-setting by parents and promote physical activity may reduce screen time among youth [13]. Screen time was also associated with poor attachment to parents and peers in adolescents [14]. Therefore, anticipatory guidance for healthy behavioral changes should be focused on the family. Parents should recognize and

understand their own roles in modeling appropriate media use and balance between media time and other activities [15]. To maximize health benefits, approaches to resolve the inactivity crisis should attempt to both increase deliberate physical activity and decrease sedentary behaviours, especially in the pediatric population [16].

There were several limitations that need to be considered in interpreting these results. We collected our data by means of a questionnaire which was designed for this study, but our results were easy to interpret and to compare with other studies. We also have a moderate sample of this two uniform groups of students. At first, the strength of our study could be considered through the research work in primary healthcare. The method of this study could be the basis for larger studies with more participants included.

### CONCLUSIONS

This research showed that more than half of the students in Indija ignored the recommendations for screen time on workdays and at weekends, secondary school students considerably more than elementary school students. Approximately forty percents of the pupils did not participate in extracurricular sports. Elementary school students participate significantly more than secondary school students, with significant decline in secondary school girls. In the future some public programs should be focused on students of these two groups (5th - 8th grade of elementary school) to prevent decline in sports activities among high school students resulting in screen time increase.

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### REFERENCES

1. Katzmarzyk PT, Church TS, Craig CL, Bouchard C. Sitting time and mortality from all causes, cardiovascular disease, and cancer. *Med Sci Sports Exerc.* 2009; 41(5): 998-1005. doi:10.1249/MSS.0b013e3181930355
2. UNICEF. The State of the world's children 2017. Children in a Digital World. 2017.
3. Strasburger VC, Hogan MJ, Mulligan DA, Ameenuddin N, Christakis DA, Cross C, et al. Children, adolescents, and the media. *Pediatrics.* 2013; 132(5): 958-61.
4. Strasburger VC, Jordan AB, Donnerstein E. Health effects of media on children and adolescents. *Pediatrics.* 2010; 125(4): 756-767. doi:10.1542/peds.2009-2563
5. Stiglic N, Viner RM. Effects of screentime on the health and well-being of children and adolescents: a systematic review of reviews. *BMJ Open.* 2019;9(1):e023191. doi:10.1136/bmjopen-2018-023191
6. WHO. Global Strategy on Diet, Physical Activity and Health [Cited 2020. June 7th]. Available from: [https://www.who.int/dietphysicalactivity/factsheet\\_young\\_people/en/](https://www.who.int/dietphysicalactivity/factsheet_young_people/en/)
7. World Health Organization. Global Status Report on Noncommunicable Diseases. WHO. 2014. [cited 2020/06/07]; Available from:



- 2019;9(1):e023191. doi:10.1136/bmjopen-2018-023191)
6. WHO. Global Strategy on Diet, Physical Activity and Health [Cited 2020. June 7th]. Dostupno na: [https://www.who.int/dietphysicalactivity/factsheet\\_young\\_people/en/](https://www.who.int/dietphysicalactivity/factsheet_young_people/en/)
  7. World Health Organization. Global Status Report on Noncommunicable Diseases. WHO. 2014. [cited 2020/06/07]; Dostupno na: <http://www.who.int/nmh/publications/ncdstatus-report-2014/en/>.
  8. 2011 Census of Population, Households and Dwellings in the Republic of Serbia: Comparative Overview of the Number of Population in 1948, 1953, 1961, 1971, 1981, 1991, 2002 and 2011, Data by settlements. Statistical Office of Republic Of Serbia, Belgrade.2014. Dostupno na: <http://pod2.stat.gov.rs/ObjavljenePublikacije/Popis2011/Knjiga20.pdf>
  9. Domingues-Montanari S. Clinical and psychological effects of excessive screen time on children. *J Paediatr Child Health*. 2017; 53(4): 333-338. doi:10.1111/jpc.13462
  10. IZJZ Srbije „ Dr Milan Jovanović Batut“. Rezultati istraživanja ponašanja u vezi sa zdravljem dece školskog uzrasta u Republici Srbiji 2018.godine. Beograd; 2019.
  11. Alberga AS, Sigal RJ, Goldfield G, Prud'homme D, Kenny GP. Overweight and obese teenagers: why is adolescence a critical period? *Pediatr Obes*. 2012; 7(4): 261–73.
  12. Currie C, Zanotti C, Morgan A, et al. (2012) Social determinants of health and well-being among young people. Health Behaviour in School-aged Children (HBSC) study: International report from the 2009/2010 survey. Dostupno na: <http://www.euro.who.int/en/health-topics/Life-stages/child-and-adolescent-health/publications/2012/social-determinants-of-healthand-well-being-among-young-people.-healthbehaviour-in-school-aged-children-hbsc-study>
  13. Carlson SA, Fulton JE, Lee SM, Foley JT, Heitzler C, Huhman M. Influence of limit-setting and participation in physical activity on youth screen time. *Pediatrics*. 2010; 126(1): e89-e96. doi:10.1542/peds.2009-3374
  14. Richards R, McGee R, Williams SM, Welch D, Hancox RJ. Adolescent screen time and attachment to parents and peers. *Arch Pediatr Adolesc Med*. 2010; 164(3): 258-262. doi:10.1001/archpediatrics.2009.280)
  15. Reid Chassiakos YL, Radesky J, Christakis D, Moreno MA, Cross C; COUNCIL ON COMMUNICATIONS AND MEDIA. Children and Adolescents and Digital Media. *Pediatrics*. 2016;138(5):e20162593. doi:10.1542/peds.2016-2593
  16. Tremblay MS, LeBlanc AG, Kho ME, et al. Systematic review of sedentary behaviour and health indicators in school-aged children and youth. *Int J Behav Nutr Phys Act*. 2011; 8: 98. doi: 10.1186/1479-5868-8-98

- <http://www.who.int/nmh/publications/ncdstatus-report-2014/en/>
8. 2011 Census of Population, Households and Dwellings in the Republic of Serbia: Comparative Overview of the Number of Population in 1948, 1953, 1961, 1971, 1981, 1991, 2002 and 2011, Data by settlements. Statistical Office of Republic Of Serbia, Belgrade.2014. Available from: <http://pod2.stat.gov.rs/ObjavljenePublikacije/Popis2011/Knjiga20.pdf>
  9. Domingues-Montanari S. Clinical and psychological effects of excessive screen time on children. *J Paediatr Child Health.* 2017; 53(4): 333-338. doi:10.1111/jpc.13462
  10. IZJZ Srbije „ Dr Milan Jovanović Batut“. Rezultati istraživanja ponašanja u vezi sa zdravljem dece školskog uzrasta u Republici Srbiji 2018.godine. Beograd; 2019.
  11. Alberga AS, Sigal RJ, Goldfield G, Prud'homme D, Kenny GP. Overweight and obese teenagers: why is adolescence a critical period? *Pediatr Obes.* 2012; 7(4): 261-73.
  12. Currie C, Zanotti C, Morgan A, et al. (2012) Social determinants of health and well-being among young people. Health Behaviour in School-aged Children (HBSC) study: International report from the 2009/2010 survey. Available at: <http://www.euro.who.int/en/health-topics/Life-stages/child-and-adolescent-health/publications/2012/social-determinants-of-healthand-well-being-among-young-people.-healthbehaviour-in-school-aged-children-hbsc-study>
  13. Carlson SA, Fulton JE, Lee SM, Foley JT, Heitzler C, Huhman M. Influence of limit-setting and participation in physical activity on youth screen time. *Pediatrics.* 2010; 126(1): e89-e96. doi:10.1542/peds.2009-3374
  14. Richards R, McGee R, Williams SM, Welch D, Hancox RJ. Adolescent screen time and attachment to parents and peers. *Arch Pediatr Adolesc Med.* 2010; 164(3): 258-262. doi:10.1001/archpediatrics.2009.280
  15. Reid Chassiakos YL, Radesky J, Christakis D, Moreno MA, Cross C; COUNCIL ON COMMUNICATIONS AND MEDIA. Children and Adolescents and Digital Media. *Pediatrics.* 2016;138(5):e20162593. doi:10.1542/peds.2016-2593
  16. Tremblay MS, LeBlanc AG, Kho ME, et al. Systematic review of sedentary behaviour and health indicators in school-aged children and youth. *Int J Behav Nutr Phys Act.* 2011; 8: 98. doi:10.1186/1479-5868-8-98