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Differences in the physical activity level of adolescent female students

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Abstract

The aim of this study was to determine the level of physical activity in adolescent girls and differences in their physical activity with respect to birth year, nutrition level and secondary school type. The level of physical activity was measured by the Fels physical activity questionnaire for children. The results indicate that there are only 33% of physically active adolescent girls in this population. The results show significant differences in the level of physical activity with respect to birth year ($p<0.001$), nutrition level ($p<0.01$) and secondary school type ($p<0.01$). It can be concluded that the general level of physical activity is very low and that the level of physical activity in adolescent girls can be classified by birth year, nutrition level and secondary school type. When planning to increase the level of physical activity in population, some special attention should be paid to girls in vocational schools and those with excessive body weight.

Key words: *adolescent girls, differences, physical activity*

Introduction

The physical activity is an important factor in achieving an optimal health status and it also helps us to reduce the risk of various diseases, which has been confirmed by many studies around the world (Eyler et al. 2003; Lee and Paffenbarger, 2000; Pate, 1995; Blair, 1996). The level of physical activity in the world is increasingly declining, while overweight and obesity are increasing and represent one of the biggest global problems worldwide. Insufficient levels of physical activity and overweight seize 2.5 million lives per year (World Health Organization, 2006). The health consequences are particularly fatal for children and adolescents because, apart from contributing to a number of physical illnesses, they also contribute to mental illnesses (Wang and Lobstein, 2006).

Many authors prove in their studies that there are differences in the levels of physical activity among adolescents according to various criteria (Mota et al., 2008; Elgari et al., 2005; Levin et al., 2003; Ekelund et al., 2002). The outcomes of these studies are very heterogeneous. This is understandable if we know that the adolescent age is very complex (World Health Organization, 2006) and that the area of physical activity is influenced by many factors, so the results on every sample may be different (Martinez – Gonzalez et al., 2001). Assessing the level of physical activity is today considered the first stage of implementing emergency measures that may contribute to health at a population level (Dishman et al., 2004). Therefore, the results obtained here may be of utmost importance for introducing emergency measures with the aim of preserving and improving health of adolescent girls in Croatia.

The basic aim of this study was to determine the level of physical activity among adolescent girls and the differences in their physical activity with respect to year of birth, type of secondary school and level of nutrition. It was hypothesized that most adolescent girls did not match physical activity level recommendations and could be differentiated by the selected criteria.

Methods

Occasional type sample, large enough to be representative for the population, includes 1049 adolescent girls from seven secondary schools in the County of Istria. The entire research was conducted during regular PE classes.

The sample was subsequently divided according to birth years into: year of birth '94 (N – 379 girls), year of birth '93 (N – 297 girls) and year of birth '92 (N – 373 girls). Starting from the calculations of body mass index, using the tables recommended by the International Obesity Task Force (Cole et al., 2000), the respondents were divided into two groups according to the level of nutrition: respondents with normal weight (N – 861 girls) and overweight ones (N – 188 girls). The third criterion refers to the classification of Croatian secondary schools by the Ministry of Science, Education and Sports, such as comprehensive schools (425 adolescent girls) and vocational schools (624 adolescent girls).

The measuring procedure was carried out from February 1st to February 26th 2010, at the same time of day (± 2 hours), one visit to each school. On that day the students enrolled and they were explained the research procedures. The research team members recorded data on the chronological age, measured the body weight and height, on which the calculation of body mass index was based. Standing height was measured to the nearest 0.1 cm with the Martin-type anthropometer for the standing posture, with shoes removed, feet together, and head in the Frankfort horizontal plane. Body mass was measured with the medical type scale. All participants were examined without their shoes and wearing only light clothing. Their physical activity was estimated with the help of the Fels physical activity questionnaire for children. During the time for the questionnaire administration, the research team members were available for

any possible questions. The questionnaire validity and reliability are presented in the paper by Treuth et al. (2005). The same work presents the questionnaire, as well as the scoring algorithm with formulas. The questionnaire contains eight questions, three of which are open-ended where respondents indicate activities, and data on the frequency of participation in each activity are obtained. For the remaining five questions, the Likert scale for physical activity assessment is used. The level of physical activity of a particular person was assessed across three components such as sport, leisure time and housework in order to obtain the overall level of physical activity. The physical activity level assessed in this way enables the comparison with given standards needed for necessary steps in terms of maintaining and improving health and making comparisons with results obtained from other populations.

The study was approved by the Council of the Faculty Kinesiology, University of Zagreb, and the Senate of the University of Zagreb. We obtained the approvals and the consents of all secondary schools included in this study, the approval of one parent of each female student as well as the girls' personal consents.

The data analysis was carried out with STATISTICA program (data analysis software system), version 7.1., StatSoft, Inc. (2005). The results are presented as averages and standard deviations; significant differences were tested at the $p<0.05$ significance level. We compared the level of physical activity among girls of different ages, different levels of nutrition and different professional orientations. Since the data were not normally distributed, we applied the non-parametric Mann-Whitney and Kruskal-Wallis tests.

Results

The percentages of physically active adolescent girls by year of birth are shown in Chart 1. It can be noticed that in the whole sample only 33% physically active girls reach the recommended level of physical activity. The results by birth years indicate that the older the girls are, the more are they physically active.

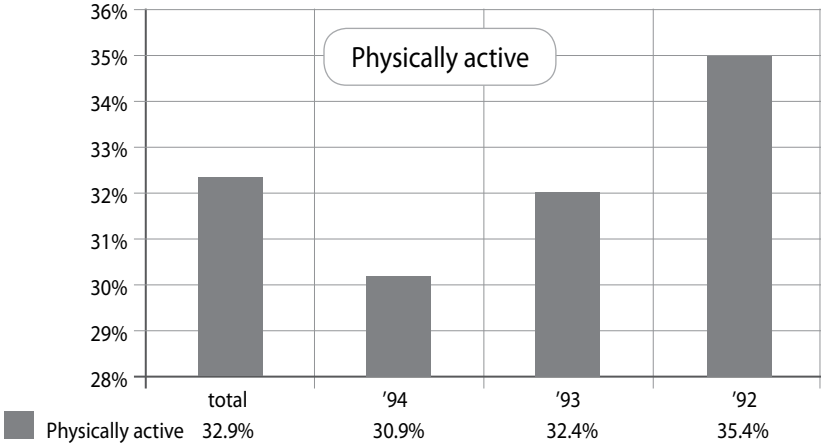

Chart 1. *The percentage of physically active adolescent girls by birth year*

The percentages of physically active adolescent girls by secondary school type are shown in Chart 2. The female students in comprehensive schools are by 12% more physically active in comparison to those in vocational schools.

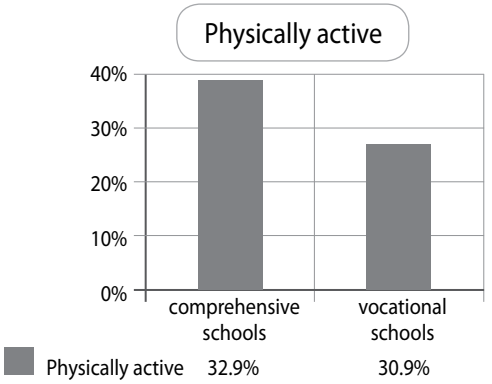

Chart 2. *The percentage of physically active adolescent girls by secondary school type*

The percentages of physically active adolescent girls by level of nutrition are shown in Chart 3. In the group of girls with normal weight there are 2.5% more physically active persons compared to the group of girls who are overweight.

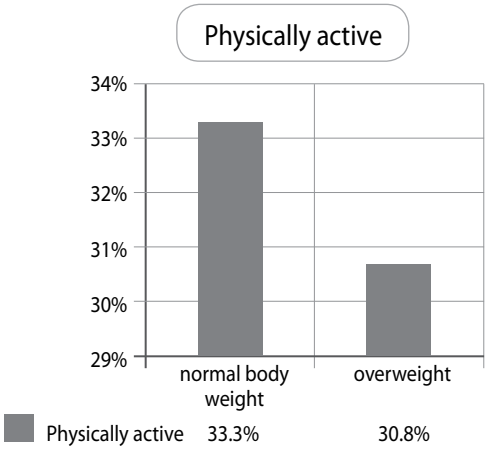

Chart 3. *The percentages of physically active adolescent girls by level of nutrition*

The average values of the level of physical activity on the total number of girls are presented in Table 1. It can be noticed that according to the total number, as well as according to all classification criteria, girls are on average most active during leisure time, then during housework and least in sports.

Table 1. *The level of physical activity on the total sample*

	Total score	Sport score	Leisure score	Work score
	M ± SD	M ± SD	M ± SD	M ± SD
GIRLS (N=1049)	6.57 ± 2.32	1.69 ± 1.72	3.11 ± 0.75	1.77 ± 0.81

The difference analysis regarding girls classified by their age is shown in Table 2. On the total level of physical activity they do not significantly differ by year of birth. If we look at the physical activity by components, we can, however, notice that the group of girls born in 1992 is significantly more active in household tasks (92 – 94 - U=39101, p=0.00; 92 – 93 - U=25281.5, p=0.00). There is no significant difference between the groups regarding sports and leisure time.

Table 2. *Differences in the level of physical activity according to the criterion of birth year*

	'94 (N=379)	**'93** (N=297)	**'92** (N=373)		
	M ± SD	**M ± SD**	**M ± SD**	**H**	**p**
Total score	6.39 ± 2.31	6.61 ± 2.43	6.73 ± 2.23	5.328	0.07
Sport score	1.65 ± 1.71	1.74 ± 1.72	1.70 ± 1.72	0.395	0.82
Leisure score	3.09 ± 0.76	3.10 ± 0.74	3.12 ± 0.76	0.619	0.73
Work score	1.65 ± 0.81	1.76 ± 0.87	1.91 ± 0.76*	19.294	0.00
**significant difference between the'92 birth year and the'94 and '93 birth year groups (p<0.001)*					

The results of differences in the physical activity regarding adolescent girls classified by the criterion of secondary school are shown in Table 3. Female students in comprehensive schools are significantly more active than female students in vocational schools regarding the total physical activity and partially housework. In the areas of sport and leisure time there are no significant differences.

Table 3. *Differences in the level of physical activity according to the criterion of professional orientation*

	Comprehensive schools (N=425)	**Vocational schools** (N=494)		
	M ± SD	**M ± SD**	**U**	**P**
Total score	7.06 ± 2.39 *	6.23 ± 2.41	72630.5	0.00
Sport score	1.81 ± 1.82	1.63 ± 1.75	80278.5	0.20
Leisure score	3.15 ± 0.95	3.07 ± 0.81	86710	0.72
Work score	2.09 ± 1.60 *	1.54 ± 1.43	63596	0.00
** significant difference between comprehensive and vocational schools (p<0.01)*				

The results of differences in the physical activity regarding adolescent girls classified according to the level of nutrition are shown in Table 4. The girls of normal weight are significantly more active in terms of the overall physical activity and sports than

the girls who are overweight. In the components of leisure time and housework no significant differences were obtained.

Table 4. *Differences in the level of physical activity according to the criterion of nutrition level*

	Normal body weight (N=861)	**Overweight** (N=188)		
	M ± SD	**M ± SD**	**U**	**p**
Total score	6.56 ± 2.57 *	5.82 ± 2,.49	117056	0.00
Sport score	1.73 ± 1.75 *	0.93 ± 1.74	110320	0.00
Leisure score	3.09 ± 0.72	3.07 ± 0.67	7825.5	0.57
Work score	1.74 ± 1.13	1.82 ± 1.02	8106	0.92
** significant difference between the normal body weight group and the overweight group (p<0.01)*				

Discussion

The results of some previous studies considering the participation in physical activity, conducted on a sample representative for the European Union, indicate that, during leisure time, the inhabitants of the northern European countries are more physically active than the inhabitants of the southern European countries (Martinez – Gonzalez et al., 2001). The highest percentage of participation in physical activity was reported in Finland (91.9%) and the lowest in Portugal (40.7%). The conclusion suggests that the global level of physical activity is low and different for each country; also that lifestyle habits significantly affect the level of physical activity (Martinez – Gonzalez et al., 2001). If we compare the results of this study with the European countries, we can see that this sample recorded the worst results with only 33% physically active persons. This is certainly a fact which indicates that it is necessary to react quickly and even in elementary schools and, with adequate procedures, to try to modify current habits that lead to a very poor situation in the level of physical activity. The higher percentage of physically active girls in the elderly groups suggests that the period of adolescence may be the right time to take preventive actions for girls.

Girls are, on average, most physically active during leisure time and many authors indicate the level of physical activity during leisure time as an important indicator of a risky way of life (Mišigoj – Duraković et al., 1999). The appropriate level of physical activity during leisure time is considered the first step contributing to health (Ischander et al., 2007).

Very low average results were achieved in the sport component. The sport activity component is very important for people at that age and it must be paid special attention (Sulema et al., 2006). While at school, the physical activity of students is significantly reduced, partly because of many hours spent in a sitting position and partly due to a large amount of homework and learning that again require a certain period of sitting at home. In addition to all that has been said so far, we must emphasize the overwhelming fact that extracurricular sport activities or sport sections

of school sport associations are not held regularly in any of the secondary schools included in this research. One of the reasons could certainly be the overloaded school schedule and the introduction of some additional school subjects like more foreign languages, etc. Another reason is the lack of sport halls and indoor space for exercising in general. Namely, one hall is intended for more schools and it is barely possible to make a schedule for regular classes. All the above mentioned reasons represent aggravating circumstances for extracurricular sport activities and contribute to more modest results regarding the level of physical activity, especially in the field of sports (Petrić, 2011). Regardless of consequences, every school should ensure the uninterrupted performance of extracurricular sport activities, since it might be one of the basic steps to increase the level of physical activity of adolescents (Petrić, 2011.).

It has been proven in many studies that there are differences in the levels of physical activity in individuals of adolescent age regarding the year of birth (Mota et al., 2008; Levin et al., 2003; Ekelund et al., 2002). The obtained results are very heterogeneous due to the fact that the adolescent period is very complex and affected by many factors. The girls born in 1992 in comparison with the girls born in 1993 and 1994 are significantly more active in household tasks. In general, household activities are the activities of low intensity, they are often static, and their health value is practically insignificant (Ischander et al., 2007; Mišigoj – Duraković et al., 1999; etc.), so this may be one of the reasons why they have not contributed to a significant difference in the total physical activity. Furthermore, the older the girls are, the more they take over the roles of their mothers and are more engaged in housework.

Some previous studies on the physical activity of adolescents with regard to the type of secondary school have confirmed that comprehensive school students are more interested in sports and physical activities and are more physically active than their peers of some different professional orientation (Prot and Bosnar, 2007; Bosnar and Prot, 1999). The authors suggest that one possible explanation of the significantly higher level of physical activity considering comprehensive school students may also be in the annual school curriculum. Namely, the comprehensive school program offers broader general knowledge which intellectually enriches their students and it is well known that such individuals are more eager to reach adequate levels of physical activity (Martinez – Gonzalez et al., 2001; Mišigoj – Duraković et al., 1999). We should not ignore the fact that, while at school, students significantly change their way of life, their movement is reduced and PE is not sufficiently present at school (Sulema et al., 2006). The results of previous studies have shown that, in fact, a high risk of inactivity occurs at school due to a great number of hours spent in a sitting position (Sulema et al., 2006). The fact that the majority of vocational schools have only one PE hour a week regularly, as opposed to comprehensive schools with two obligatory hours a week, most certainly contributes to such results and represents aggravating circumstances for some positive impact on kinanthropological features.

The results obtained in previous studies dealing with the problem of differences in the level of physical activity with respect to the level of nutrition are similar to

the results of this research. Adolescent girls with normal weight had significantly higher levels of physical activity than overweight girls of the same age (Levin et al., 2003; Ekelund et al., 2002). The analysis showed that girls having normal body weight are significantly more active in the overall degree of physical activity and in the area of sports. Based on the results obtained, we can say that the girls of normal weight are much more involved in organized sport activities than girls falling into the excessive body weight group. Although we have not obtained considerable differences between these groups regarding leisure time and household activities, the area of sports contributed significantly to the overall level of physical activity. Physical Education in Croatia is obligatory at the secondary education level and this very fact may be used for preventive actions on the population level in order to increase the level of physical activity of adolescents. An important role in the education system can be given to PE teaching, its schedule should be increased, and school sport clubs must function in their real essence and gather the largest possible number of students in their schools.

The fact is that physical activity has an important influence on the reduction of overweight and obesity and it is considered to be the most natural way of energy expenditure and weight control. It maintains energy balance in the body, thus preventing the occurrence of excess weight. Physical activity, through its effects, has also an impact on reducing the subcutaneous fat tissue and accelerating metabolism; it also significantly affects the hormonal system which, through its functions, prevents the occurrence of excess weight (Hill and Wyatt, 2005).

Finally, it is important to note that this research data may be of crucial importance when planning intervention measures for preserving and improving the health of young population. Also, the classification criteria methodology applied to adolescent students which did not provide an insight into the level of children's undernourishment is a limitation in case of the present study. This information would be of great help to efforts made at preserving and improving the health of students. We have to be aware of the fact that adolescence is a critical time when disorders such as anorexia and bulimia nervosa occur (Petrić, 2011).

Conclusion

Obtained results confirm the research hypothesis, the general level of physical activity among adolescent girls is very low and they can be classified regarding the level of physical activity according to some criteria such as birth year, secondary school type and nutrition level. When planning to increase the level of physical activity in a population, special attention should be paid to overweight girls and to girls in vocational schools. The results of this study can be used as basic guidelines for future studies on this population, especially with the aim to detect the main causes for such a poor physical activity level of Croatian adolescent girls. Since adolescence is highly unpredictable and physical activity differs significantly from population to population, further study on any different sample could represent a great contribution to health in the world.

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Razlike u razini tjelesne aktivnosti učenica adolescentske dobi

Sažetak

Cilj ovog istraživanja bio je utvrditi razinu tjelesne aktivnosti kod djevojaka adolescentske dobi i razlike u tjelesnoj aktivnosti s obzirom na godinu rođenja, stupanj uhranjenosti i vrstu srednje škole koju pohađaju. Razina tjelesne aktivnosti procijenjena je Felsovim upitnikom o tjelesnoj aktivnosti kod djece. Rezultati ukazuju kako je u ovoj populaciji svega 33% tjelesno aktivnih adolescentica. Dobivene su značajne razlike u razini tjelesne aktivnosti s obzirom na godinu rođenja ($p<0.001$), stupanj uhranjenosti ($p<0.01$) i vrstu srednje škole ($p<0.01$). Može se zaključiti da je opća razina tjelesne aktivnosti vrlo niska te da se prema godini rođenja, stupnju uhranjenosti i vrsti srednje škole mogu razvrstati djevojke adolescentske dobi u odnosu na razinu tjelesne aktivnosti. U planiranju povećanja razine tjelesne aktivnosti u populaciji posebnu pozornost treba usmjeriti k učenicama strukovnih škola i onima s prekomjernom tjelesnom masom.

Ključne riječi: *adolescentice, razlike, tjelesne aktivnosti*

Uvod

Tjelesna aktivnost je važan faktor u postizanju optimalnog stanja zdravlja, a isto tako djeluje na smanjenje rizika od različitih bolesti, što potvrđuju mnoge studije provedene širom svijeta (Eyler i sur. 2003.; Lee i Paffenbarger, 2000.; Pate, 1995.; Blair, 1996.). Razina tjelesne aktivnosti u svijetu sve više opada, dok prekomjerna tjelesna masa i pretilost rastu te predstavljaju jedan od najvećih globalnih problema diljem svijeta. Nedovoljna razina tjelesne aktivnosti i prekomjerna tjelesna masa godišnje oduzmu 2.5 milijuna života (Svjetska zdravstvena organizacija, 2006). Zdravstvene su posljedice posebno kobne za djecu i adolescente jer, osim što pridonose nizu tjelesnih bolesti, pridonose i psihičkim bolestima (Wang i Lobstein, 2006).

Mnogi su autori u svojim istraživanjima dokazali da postoje razlike u razini tjelesne aktivnosti kod osoba adolescentske dobi u odnosu na različite kriterije (Mota i sur., 2008; Elgari sur., 2005; Levin i sur., 2003; Ekelund i sur., 2002). Rezultati tih istraživanja

su vrlo heterogeni. Ova je činjenica razumljiva kada znamo da je adolescentsko doba vrlo složeno (Svjetska zdravstvena organizacija, 2006), a područje tjelesne aktivnosti pod utjecajem je mnogih čimbenika, stoga na svakom uzorku rezultati mogu biti različiti (Martinez – Gonzalez i sur., 2001). Procjena razine tjelesne aktivnosti danas se smatra prvom fazom u uvođenju interventnih mjera koje mogu pridonijeti zdravlju na razini cijele populacije (Dishman i sur., 2004). Stoga bi rezultati dobiveni ovim istraživanjem mogli biti od neizmjerne važnosti za uvođenje interventnih mjera u svrhu očuvanja i poboljšanja zdravlja na razini populacije adolescentica u Hrvatskoj.

Temeljni cilj ovog istraživanja bio je utvrditi razinu tjelesne aktivnosti kod djevojaka adolescentske dobi i razlike u tjelesnoj aktivnosti s obzirom na godinu rođenja, vrstu srednje škole i stupanj uhranjenosti. Može se pretpostaviti kako većina učenica adolescentske dobi ne zadovoljava preporučenu razinu tjelesne aktivnosti te se mogu razlikovati prema navedenim kriterijima.

Metodologija istraživanja

Prigodni uzorak koji je uključivao 1049 adolescentica, učenica sedam srednjih škola u Istarskoj županiji, dovoljno je velik da bude reprezentant istraživane populacije. Svi istraživački postupci provedeni su u sklopu sati tjelesne i zdravstvene kulture na redovnoj nastavi.

Uzorak je naknadno podijeljen prema kriteriju godine rođenja na: '94 godište (N – 379 djevojaka), '93 godište (N – 297 djevojaka) i '92 godište (N – 373 djevojaka). Na temelju izračunatog indeksa tjelesne mase, putem tablica preporučenih od strane International Obesity Task Force (Cole i sur., 2000), ispitanici su svrstani u dvije skupine prema stupnju uhranjenosti: ispitanici s normalnom tjelesnom masom (N – 861 djevojaka) i prekomjernom tjelesnom masom (N – 188 djevojaka). Treći kriterij čini podjela srednjih škola u Republici Hrvatskoj, koje Ministarstvo znanosti, obrazovanja i sporta dijeli na gimnazije (425 adolescentica) i strukovne škole (624 adolescentica).

Mjerenje je provedeno u razdoblju od 1. veljače do 26. veljače 2010. godine u isto vrijeme dana (± 2 sata), po jedan posjet svakoj školi. Tog dana su se učenice upisale i objašnjeni su im istraživački postupci. Članovi istraživačkog tima zabilježili su podatke o kronološkoj dobi, izmjerili masu i visinu tijela na temelju kojih se izračunao indeks tjelesne mase. Tjelesna visina mjerena je s točnosti od 0.1 cm s Martinovim antropometrom. Ispitanici su mjereni u sunožnom stavu, bez obuće i s položajem glave u Frankfortovoj horizontali. Tjelesna masa mjerena je medicinskom vagom. Svi ispitanici vagani su bez obuće, s laganom odjećom na sebi. Tjelesna aktivnost procijenjena je Felsovim upitnikom za tjelesnu aktivnost djece. Članovi istraživačkog tima bili su na raspolaganju za eventualna pitanja tijekom popunjavanja upitnika. Valjanost i pouzdanost ovog upitnika prikazana je u radu što su ga objavili Treuth i sur. (2005). U istom radu prikazan je upitnik kao i algoritam bodovanja zajedno s formulama. Upitnik sadrži osam pitanja, od kojih su tri „otvorena" pitanja za koja aktivnosti navode ispitanici i dobivaju se podatci o učestalosti sudjelovanja u svakoj

od tih aktivnosti. Za ostalih pet pitanja primjenjuje se Likertova ljestvica za procjenu tjelesne aktivnosti. Razina tjelesne aktivnosti određene osobe procjenjuje se na temelju triju komponenata kao što su sport, slobodno vrijeme i kućanski poslove, kako bi se dobila ukupna razina tjelesne aktivnosti. Ovako procijenjena razina tjelesne aktivnosti omogućuje usporedbu s predviđenim normama kako bi bilo moguće poduzeti potrebne mjere u smislu očuvanja i unapređenja zdravlja te učiniti usporedbu s rezultatima drugih populacija.

Istraživanje je odobrilo Vijeće Kineziološkog fakulteta Sveučilišta u Zagrebu i Senat Sveučilišta u Zagrebu. Dobivena je suglasnost i pristanak svake srednje škole uključene u ovo istraživanje, kao i suglasnost jednog od roditelja svake učenice te njihov osobni pristanak.

Podatci su obrađeni uz pomoć programa STATISTICA (softverski sutsav za obradu podataka), verzija 7.1., StatSoft, Inc. (2005). Rezultati su prikazani kao prosječne vrijednosti i standardne devijacije, a statistički značajne razlike testirane su na razini značajnosti $p < 0,05$. Usporedili smo razinu tjelesne aktivnosti kod djevojaka različitih godišta, zatim različitog stupnja uhranjenosti te različitih profesionalnih usmjerenja. Budući da podatci nisu bili normalno distribuirani, primijenjeni su neparametrijski Mann-Whitney i Kruskal-Wallis testovi.

Rezultati

Postotci tjelesno aktivnih adolescentica prema godištima prikazani su u Grafikonu 1. Može se uočiti kako je na ukupnom uzorku svega 33% djevojaka s preporučenom razinom tjelesne aktivnosti. Stanje po godištima ukazuje da što su djevojke starije više ih je tjelesno aktivnih.

Grafikon 1.

Postotci tjelesno aktivnih adolescentica prema vrsti srednje škole prikazani su u Grafikonu 2. Učenice gimnazija imaju 12 % više tjelesno aktivnijih osoba u odnosu na strukovne srednje škole.

Grafikon 2.

Postotci tjelesno aktivnih adolescentica prema stupnju uhranjenosti prikazani su u Grafikonu 3. U grupi djevojaka s normalnom tjelesnom masom je 2,5% osoba više tjelesno aktivnih u odnosu na grupu djevojaka s prekomjernom tjelesnom masom.

Grafikon 3.

Prosječne vrijednosti razine tjelesne aktivnosti na ukupnom broju djevojaka prikazana je u Tablici 1. Može se vidjeti da su na ukupnom broju, kao i prema svim kriterijima podjele, djevojke u prosjeku najviše aktivne u komponenti slobodnog vremena, zatim u kućanskim poslovima te najmanje u sportu.

Tablica 1.

Analiza razlika kod djevojaka podijeljenih prema kriteriju godišta prikazana je u Tablici 2. Na ukupnoj razini tjelesne aktivnosti djevojke se po godištima međusobno ne razlikuju značajno. Međutim, gledajući tjelesnu aktivnost po komponentama, možemo uočiti kako je grupa djevojaka rođena 1992. značajno aktivnija u kućanskim poslovima (92 – 94 - U=39101, p=0.00; 92 – 93 - U=25281,5, p=0,00). Kada je riječ o sportu i slobodnom vremenu, ne postoji značajna razlika između grupa.

Tablica 2.

Rezultati razlika u tjelesnoj aktivnosti između grupa adolescentica podijeljenih prema kriteriju srednjih škola prikazani su u Tablici 3. Učenice gimnazija statistički su značajno aktivnije od učenica strukovnih srednjih škola u ukupnoj tjelesnoj aktivnosti te, gledajući parcijalno, u kućanskim poslovima. U područjima sporta i slobodnog vremena nema značajnih razlika.

Tablica 3.

Rezultati razlika u razini tjelesne aktivnosti između adolescentica podijeljenih prema stupnju uhranjenosti prikazani su u Tablici 4. Djevojke normalne tjelesne mase značajno su aktivnije u ukupnoj tjelesnoj aktivnosti i u komponenti sporta od djevojaka prekomjerne tjelesne mase. U komponenti slobodnog vremena i kućanskim poslovima nije dobivena značajna razlika.

Tablica 4.

Diskusija

Rezultati nekih dosadašnjih istraživanja o sudjelovanju u tjelesnoj aktivnosti, koji su provedeni na reprezentativnom uzorku za Europsku uniju, ukazuju da stanovnici sjevernih europskih zemalja više sudjeluju u tjelesnoj aktivnosti u slobodno vrijeme nego stanovnici južnih europskih zemalja (Martinez – Gonzalez i sur. 2001). Najveći postotak sudjelovanja u tjelesnoj aktivnosti je iskazan u Finskoj (91,9%), a najniži u Portugalu (40,7%). Zaključak ukazuje da je globalno nivo tjelesne aktivnosti nizak i vrlo različit za svaku zemlju te da životne navike znatno utječu na razinu tjelesne aktivnosti (Martinez – Gonzalez i sur. 2001). Usporedimo li rezultate ovog istraživanja s europskim zemljama, možemo uočiti kako se ovaj uzorak ispitanika ubraja u najlošije rezultate sa svega 33% tjelesno aktivnih osoba. Ta činjenica svakako ukazuje da je potrebno žurno reagirati i već u osnovnim školama s adekvatnim postupcima utjecati na mijenjanje dosadašnjih životnih navika koje su dovele do izrazito lošeg stanja u pogledu razine tjelesne aktivnosti. Viši postotak tjelesno aktivnih djevojaka kod starijih grupa ukazuje kako bi upravo ovo adolescentsko razdoblje moglo biti pravo vrijeme za preventivno djelovanje kod djevojaka.

Djevojke su u prosjeku najviše tjelesno aktivne tijekom slobodnog vremena, a mnogi autori upravo razinu tjelesne aktivnosti tijekom slobodnog vremena navode kao značajan pokazatelj rizičnog načina življenja (Mišigoj – Duraković i sur., 1999). Odgovarajuća razina tjelesne aktivnosti tijekom slobodnog vremena smatra se prvim korakom u doprinosu zdravlju (Ischander i sur., 2007).

Vrlo su niski prosječni rezultati postignuti u tjelesnoj aktivnosti u komponenti sporta. Komponenta sportske aktivnosti vrlo je bitna za osobe adolescentske dobi te zaslužuje posebnu pozornost (Sulema i sur., 2006). U školi se znatno smanjuje tjelesna aktivnost učenika, što zbog velikog broja sati provedenih u sjedećem položaju, što zbog obilja domaće zadaće i učenja koji opet uvjetuju određeno vrijeme u sjedećem položaju kod kuće. Uz sve do sada rečeno, valja naglasiti i poražavajuću činjenicu kako se ni u jednoj od srednjih škola u kojima je provedeno ovo istraživanje u praksi ne održavaju redovito izvannastavne sportske aktivnosti, odnosno sportske sekcije školskih sportskih društava. Jedan bi od razloga sasvim sigurno mogao biti preopterećenost školskog rasporeda i uvođenje novih predmeta u škole, kao što su više stranih jezika i sl. Drugi razlog je nedostatak sportskih dvorana i općenito zatvorenih prostora za vježbanje. Naime, jedna dvorana namijenjena je za više škola te se jedva napravi raspored za redovnu nastavu. Sve navedeno predstavlja otežavajuće okolnosti za izvannastavne sportske aktivnosti i pridonosi skromnijim rezultatima glede razine tjelesne aktivnosti, posebno u području sporta (Petrić, 2011.). Svaka bi škola, bez obzira na posljedice, morala osigurati nesmetano izvođenje izvannastavnih sportskih aktivnosti jer bi to mogao biti jedan od temeljnih koraka koji će utjecati na povećanje razine tjelesne aktivnosti adolescenata (Petrić, 2011.).

U dosadašnjim je istraživanjima dokazano da kod osoba adolescentske dobi postoje razlike u razini tjelesne aktivnosti u odnosu na godinu rođenja (Mota i sur., 2008; Levin i sur., 2003; Ekelund i sur., 2002). Dobiveni su rezultati vrlo heterogeni zbog činjenice da je adolescentsko doba vrlo složeno i pod utjecajem je mnogih čimbenika. Djevojke rođene 1992. godine značajno su aktivnije u kućanskim poslovima od djevojaka rođenih 1993. i 1994. Kućanski poslovi u pravilu predstavljaju aktivnosti slabog intenziteta i vrlo su često statični te je njihova zdravstvena vrijednost praktički zanemariva (Ischander i sur., 2007; Mišigoj – Duraković i sur., 1999; i dr.), pa bi to mogao biti jedan od razloga zašto nisu pridonijeli značajnoj razlici u ukupnoj tjelesnoj aktivnosti. Nadalje, što su djevojke starije to više preuzimaju uloge svojih majki te se sve češće bave kućanskim poslovima.

Neka dosadašnja istraživanja o tjelesnoj aktivnosti s obzirom na vrstu srednje škole osoba adolescentske dobi potvrđuju da su polaznici gimnazija više zainteresirani za sportske i tjelesne aktivnosti i tjelesno su aktivniji od svojih vršnjaka koji su odabrali neko drugo profesionalno usmjerenje, odnosno srednju školu (Prot i Bosnar, 2007; Bosnar i Prot, 1999). Autori navode da jedno od mogućih objašnjenja značajno više razine tjelesne aktivnosti polaznika gimnazija može biti i u godišnjem planu i programu rada škole. Naime, gimnazije imaju program koji obuhvaća široko opće znanje i intelektualno bogati svoje učenice i učenike te je poznato da su takve osobe motiviranije

postići odgovarajuće razine tjelesne aktivnosti (Martinez – Gonzalez i sur., 2001; Mišigoj – Duraković i sur., 1999). Ne treba zanemariti činjenicu da u školi učenice i učenici znatno mijenjaju način života i manje se kreću, a tjelesni odgoj u školama nije dovoljno zastupljen (Sulema i sur., 2006). Rezultati dosadašnjih istraživanja pokazuju kako upravo u školama postoji veliki rizik od neaktivnosti zbog velikog broja sati provedenih u sjedećem položaju (Sulema i sur., 2006). Ovakvim rezultatima sasvim sigurno pridonosi i činjenica da većina strukovnih srednjih škola ima svega jedan sat tjedno redovne nastave tjelesne i zdravstvene kulture za razliku od gimnazija koje imaju obvezna dva sata tjedno, što također otežava pozitivni utjecaj na kinantropološka obilježja.

Rezultati dobiveni u dosadašnjim istraživanjima, koja su se bavila problemom razlika u razini tjelesne aktivnosti s obzirom na stupanj uhranjenosti, slični su rezultatima ovog istraživanja. Djevojke adolescentske dobi koje su normalne tjelesne mase imaju značajno višu razinu tjelesne aktivnosti od osoba prekomjerne tjelesne mase iste dobi (Levin i sur., 2003; Ekelund i sur., 2002). Analiza je pokazala da su djevojke koje ulaze u kriterije normalne tjelesne mase značajno tjelesno aktivnije u ukupnoj razini tjelesne aktivnosti i u području sporta. S obzirom na dobivene rezultate može se reći da se djevojke normalne tjelesne mase puno više bave organiziranim sportskim aktivnostima od djevojaka koje ulaze u kriterije prekomjerne tjelesne mase. Iako u području slobodnog vremena i kućanskim poslovima nije dobivena značajna razlika između ovih grupa, područje sporta utjecalo je značajno na ukupnu razinu tjelesne aktivnosti. U Republici Hrvatskoj tjelesna i zdravstvena kultura je obvezni predmet tijekom srednjeg obrazovanja te bi se upravo ta činjenica mogla iskoristiti za preventivno djelovanje na razini populacije u svrhu povećanja razine tjelesne aktivnosti adolescenata. U sustavu obrazovanja veliku ulogu može imati nastava tjelesne i zdravstvene kulture kojoj svakako treba povećati satnicu, i to posebno u strukovnim školama, te školski sportski klubovi koji moraju funkcionirati u svojoj pravoj biti i okupljati što veći broj učenika svoje škole.

Činjenica je da tjelesna aktivnost znatno utječe na smanjenje prekomjerne tjelesne mase i pretilosti te se smatra najprirodnijim načinom za trošenje energije i regulaciju tjelesne mase. Ona održava energetski balans u organizmu te tako sprječava pojavu suvišnih kilograma. Svojim djelovanjem tjelesna aktivnost utječe i na smanjenje potkožnog masnog tkiva te na ubrzanje metabolizma, a značajno utječe i na hormonski sustav koji opet svojim djelovanjem sprječava pojavu suvišnih kilograma (Hill i Wyatt, 2005).

Konačno, važno je primijetiti da rezultati ovog istraživanja mogu biti od ključne važnosti kada se planiraju interventne mjere namijenjene očuvanju i poboljšanju zdravlja mladih. Osim toga, metodologija prema kojoj se određuju kriteriji za klasifikaciju učenika i učenica adolescentske dobi, koja nije dala uvid u razinu pothranjenosti kod djece, nameće se kao ograničenje u ovom istraživanju. Taj bi nam podatak trebao biti vrlo koristan pri nastojanju da očuvamo i poboljšamo zdravlje učenika i učenica. Moramo biti svjesni činjenice da je adolescentsko doba kritično razdoblje kada se pojavljuju anoreksija i bulimija (Petrić, 2011).

Zaključak

Dobiveni rezultati potvrđuju postavljenu hipotezu: opća razina tjelesne aktivnosti adolescentica vrlo je niska te se prema kriterijima kao što su godina rođenja, vrsta srednje škole i stupanj uhranjenosti djevojke adolescentske dobi mogu razvrstati prema razini tjelesne aktivnosti. U planiranju povećanja razine tjelesne aktivnosti u populaciji posebnu pozornost treba usmjeriti k učenicama strukovnih škola i onima s prekomjernom tjelesnom masom. Rezultati ovog istraživanja mogu poslužiti kao temeljne smjernice za buduća istraživanja na ovoj populaciji i to posebno u svrhu otkrivanja glavnih uzroka ovako lošeg stanja razine tjelesne aktivnosti adolescentica u Hrvatskoj. Kako je doba adolescencije izrazito nepredvidivo i kako se tjelesna aktivnost veoma razlikuje od populacije do populacije, svako daljnje istraživanje na različitim uzorcima moglo bi biti veliki doprinos zdravlju u svijetu.