

THE ROLE OF SPORTS CLUBS IN SPORTS ACTIVITY OF STUDENTS

VLOGA ŠPORTNIH KLUBOV PRI ŠPORTNI AKTIVNOSTI ŠTUDENTOV

Petra Golja¹, Tatjana Robič¹

Prispelo: 21. 12. 2012 – Sprejeto: 8. 8. 2013

Original scientific article
UDC 614:796-057.875

Abstract

Objective: Exercise is a recognised means for improving quality of life. In general, students perform less sports activity than previous generations. In contrast, however, children's participation in competitive sports has increased. The present study therefore aimed to assess how many students participate in sports clubs, how active in sports student (non)members are, and what actual effect sports clubs have on enabling sufficient sports activity.

Methods: Students (N=213) in the first year of university studies (19-20 years) were recruited for a study approved by the Slovenian Ethics Committee. They answered a questionnaire on their sports club membership and on their sports activity during organised sports training and/or in their free time. Results were statistically analysed and compared to our previous results obtained from primary and secondary school children (1).

Results: Only 16% of students participate in sports clubs, which is less ($p<0.001$) than in primary and secondary school children. The average (SD) sports activity of student sports-club members is 11.7 (6.8) h/week, with students non-members being significantly ($p<0.001$) less active with 4.6 (3.0) h/week. Participation in sports clubs is lower ($p<0.001$) in female (15%) than in male (21%) students, which is similar to children.

Conclusions: The results of the study demonstrate that sports clubs in Slovenia are important for promoting sufficient sports activity. Namely, most of the student members participate in sports activity more than the recommended 1 h/day and are more than two times more active than their peers. Females, however, participate less often in sports clubs, which calls for further attention.

Key words: active lifestyle, students, sports activity, sports clubs, weekly activity

Izvirni znanstveni članek
UDK 614:796-057.875

Izvleček

Uvod: Športna vadba je danes priznано sredstvo za izboljšanje kakovosti življenja. V splošnem velja, da so študentje manj športno aktivni kot prejšnje generacije. V nasprotju s tem pa se mlajši mladostniki pogosteje vključujejo v tekmovalni šport. Cilj te raziskave je bil zato oceniti, koliko študentov je vključenih v športne klube, kako športno dejavni so študentje ne(člani) in kakšen dejanski učinek imajo športni klubi pri doseganju zadostne športne aktivnosti.

Metode: V raziskavo, ki jo je odobrila Komisija Republike Slovenije za medicinsko etiko, so bili vključeni študentje (N=213) prvega letnika univerzitetnih študijev (19–20 let). Izpolnili so vprašalnik o svojem članstvu v športnih klubih ter o svoji športni aktivnosti med organiziranimi športnimi treningi in/ali v svojem prostem času. Rezultate smo statistično analizirali in jih primerjali z rezultati predhodne raziskave, izvedene med osnovnošolci in srednješolci (1).

Rezultati: Le 16% študentov je bilo včlanjenih v športne klube, kar je manj ($p<0,001$) kot med osnovnošolci in srednješolci. Povprečna (SD) športna aktivnost študentov članov športnih klubov je bila 11,7 (6,8) h/teden; študentje nečlani so bili s 4,6 (3,0) h/teden značilno ($p<0,001$) manj aktivni. Študentke (15%) so v športne klube vključene redkeje ($p<0,001$) kot študenti (21%), kar je podobno kot pri mlajših mladostnikih.

Zaključki: Rezultati raziskave kažejo, da so športni klubi v Sloveniji pomembni pri spodbujanju zadostne športne aktivnosti, saj je večina študentov članov športno aktivna več kot priporočeno 1 h/dan in je tako več kot dvakrat

aktivnejša od vrstnikov nečlanov. Dekleta so v nasprotju s fanti v športne klube včlanjena redkeje, kar si zasluži nadaljnjo analitično obravnavo.

Ključne besede: aktiven življenjski slog, športni klubi, študentje, tedenska aktivnost, športna aktivnost

1 INTRODUCTION

Although the capability of prolonged exertion and physical expertise are less important for human survival nowadays than in earlier human populations (2), regular sports activity is a recognised mean for improving quality of life in the contemporary world (2, 3). Regular sports activity has on several occasions been proven beneficial for positive physical and psychological development in children and adults (4-6).

Both, in children and adults, regular sports activity influences their health in a positive manner, as it lowers the level of cardiovascular risks (7). Also, just as a sedentary way of life causes children and adolescents to become overweight and obese (4), regular sports activity helps in successful management of optimal body mass. Sports activity undoubtedly also effects physical development, because active children demonstrate better motor control than their peers (7, 8) as well as better motor skill competence (9). Last, but not least, it seems that sports activity of children increases the probability of active lifestyle in adulthood (7, 10, 11).

It has been demonstrated that apart from the stated positive physiological effects of active lifestyle in childhood and adolescence, regular organised sports activity of children improves their motor, mental and emotional development. For both genders, but for girls in particular, the amount of time spent in organised sports activity correlates closely with their movement skills (12). In addition, organised sports activity involves socialisation of children with their peers, which enables them to learn sports as well as social skills that they can use in their everyday life (7, 13). Regular sports activity has also been demonstrated to positively influence academic outcomes, such as grades (14), test scores and school engagement, to result in higher self-esteem and to reduce depression (4). Better motor coordination has also been positively associated with intelligence in adolescents (15). Lastly, through organised sports activities, which are defined by rules and norms, children can also control aggression (4).

Taking into account all the recognised benefits of sports activity, the U.S. Centres for Disease Control and Prevention recommend that children should be involved in at least 60 minutes of sports activity of moderate intensity most days of the week, preferably daily (16, 17). It is therefore alarming that according to

the existing reports, only one third of all young people in Europe and North America are involved in 60 minutes or more of such activity at least five times per week (16). In comparison to younger children, the population of students deals with further obstacles associated with sports activity. Diverse course schedules, higher requirements for learning, and often a significant amount of time spent for traveling from home to the place of study are only a few of the reasons for the lack of time devoted to sports activity in students. Due to regular systematic monitoring of sports activity levels in primary and secondary school children (18, 19), reliable data exist on this issue for Slovenia. In contrast, studies only rarely focus on the student population, with a few of them demonstrating that although student interests have shifted from team to individual sports over the last decades (20), students still perceive sports activity as a positive value (21), which is evident from a rather high percentage of students who perform non-organised sports, thus sports activities in their free time (22), and would at the same time require some adaptation of the existing sports programs to suit them better (23, 24). If we widen the perspective and take into account not only the student population but also the situation with sports activities in young Slovenian people in general, the following conclusions can be made. Sports education has a long and rather successful tradition in Slovenia, nevertheless some of the new reports suggest that the situation with sports activities in children is fast approaching that of the western world. Namely, as demonstrated by the Slovenian HBSC study performed in 2006 (25), which is recognised as nationally representative within Europe, the number of teenagers in Slovenia who are active in sports for at least one hour daily at least five times per week has decreased by more than 7% in males and almost 3% in females from 2002 (N=3956) to 2006 (N=5130), thus in four years only. Similarly, a recent analysis of trends in sports activity of 11 to 15 year old children in the period of 2002 to 2010 demonstrated that although bidirectional variations between particular years can be detected, on the whole the percentage of children who fulfil the current recommendations for sports activity decreased significantly within the stated period (19). In addition to these observations, our previous work that was performed on 818 primary and secondary school children from the Northern Primorska region (including

the area from towns of Vipava to Bovec) demonstrated that although sports activity levels are decreasing in general, children in Slovenia often participate in sports clubs and, furthermore, that participation in competitive sports seems to have increased (1).

It is worthwhile noting that the organisation of voluntary sports activities in Slovenia is similar to that in Scandinavian countries (7, 26); apart from the extra-curricular school programs, organised sports activities for children are usually being organised by sports clubs, which in Slovenia are members of national sports associations. This is in contrast with the situation in the United States, where the majority of voluntary sports activities are organised by schools and universities. Although the existing organisation of voluntary sports activities in Slovenia has now been functioning for several decades, it has, however, not yet been evaluated, what are the direct effects of sports club inclusion on weekly sports activity levels in students. The aim of the present study was therefore to assess how many students take part in organised sports activities of sports clubs, how active sports student members or non-members of sports clubs are, and what is the amount of weekly sports activity in student members and non-members. We also aimed to compare the results obtained in students with our previous results obtained in children and adolescents (1) to assess differences between generations.

2 MATERIALS AND METHODS

The study protocol was approved by the National Ethics Committee of the Republic of Slovenia on 19. 3. 2011 (No.: 60/02/11) and the study was performed in Slovenia.

We observed a sample of 20-year old students enrolled in the first year of the Biotechnical Faculty and the Faculty of Education in 2010 and 2011. The students were provided with an anonymous questionnaire, and they could decide voluntarily whether they would participate in the study or not.

The questionnaire included questions about the age and gender of subjects, recent sports club membership, the amount of sports activity in their free time or during organised sports training, and the age of their first enrolment in a sports club.

The completed questionnaires were first digitalised and then analysed. We then compared the obtained information with our previous results on sports activity in younger children, specifically to data from 12 year old children enrolled in the seventh year of primary school and to those from 17 year old adolescents in the third year of secondary school (1). We also calculated the age of first inclusion into a sports-club for different age groups. As the present study was performed three and a half years after our study of primary and secondary school children (1), 17 year old adolescents and 20 year old students were actually born in the same year; therefore, data from these two subject groups were finally joined to calculate the age of first inclusion into a sports-club and were compared to children born 5 years later.

The statistical analysis was performed by a Chi-square test for the nonparametric data (gender, membership) and by a one-way-ANOVA for parametric data (age, weekly sports activity). All parametric results are presented as averages (SD).

3 RESULTS

The results were obtained from 213 students (age: 20 (0.8) years); 169 female and 44 male students participated. Students who participated in organised sports activities of at least one sports club at the time they answered the questionnaire were marked as "Members". In contrast, students who did not participate in organised sports activities of any sports club at the time of answering were marked as "Non-members". Students who were members of sports clubs in the past but were no longer engaged in a sports club at the time of answering were counted as "Non-members".

From 213 students who participated in the study, 16% of subjects (N=35) were members of sports clubs at the time of answering. When we compare this result to results obtained in younger children (1), a large difference in sports-club inclusion can be seen between the age groups and a clear reduction in sports club participation becomes obvious with age. Namely, 42% of children in primary school and 27% of adolescents in secondary school were members of sports clubs (1). The difference in sports club participation between all three age groups is highly significant ($p < 0.001$) and is presented in Figure 1.

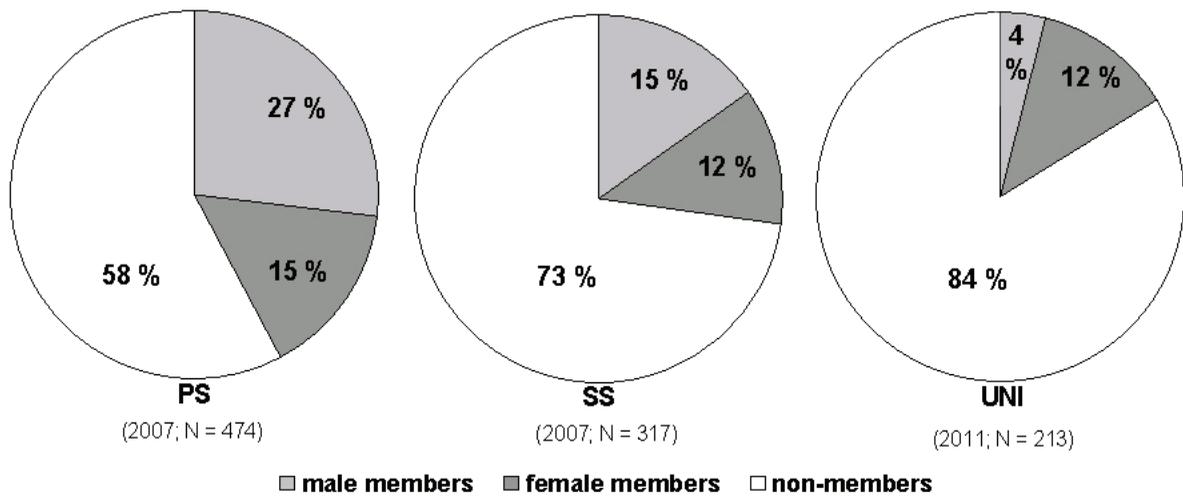


Figure 1. Participation in sports clubs according to age group and gender. Compared to children, significantly ($p < 0.001$) less students participate in sports clubs. Data for students from the present study, data for primary and secondary school children from (1), year of research study and subject number are presented for each category. PS – primary school children, SS – secondary school children, UNI – university students.

Slika 1. Članstvo v športnih klubih glede na starostno skupino in spol. V primerjavi z mlajšimi mladostniki so študenti značilno ($p < 0,001$) redkeje člani športnih klubov. Podatki za študente so iz pričujoče študije, podatki za osnovno in srednjo šolo iz (1), za vsako kategorijo sta predstavljena leto raziskave in število preiskovancev. PS – osnovnošolci, SS – srednješolci, UNI – univerzitetni študenti.

In addition, the results demonstrate that female students participate less often in sports clubs than male students ($p < 0.001$). Namely, 21% of the male students were included in sports clubs at the time of answering, but only 15% of female students. When we compare these results with younger children, a similar pattern of enrolment can be observed between the genders irrespective of age. Namely, both in primary and secondary school, more males (54% and 38%, respectively) than females (30% and 20%, respectively) participate in sports clubs (1), which is in turn all higher than within students. The differences between and within all three age groups are highly significant ($p < 0.001$).

The amount of weekly sports activity (in hours per week) was calculated for student members and non-members of sports clubs; the results are presented in Table 1. When the groups were compared, sports activity in their free time was used for student non-members, and cumulative sports activity including sports activity in their

free time and during organised sports training was used for student members. The results suggest that student non-members performed significantly less ($p < 0.0001$) sports activity than student members. This was also true for primary and secondary school children, where average sports activity of non-members was again significantly lower ($p < 0.001$) than that of members (1). Rather surprisingly, however, student non-members performed more sports activity per week than non-members in primary and secondary school (Table 1). Furthermore, significant differences were observed in the year of first enrolment of older and younger children. Namely, children born in 1990 first joined sports clubs at the age of 10.1 (3.4) years. Compared to the five year younger children born in 1995, this was both effectively and statistically ($p < 0.01$) later, as the younger group first joined sports clubs already at the age of 8.4 (1.9) years. Thus, in five years only, the age of first enrolment into a sports club decreased by more than 1.7 years (Figure 2).

Table 1. *The amount of weekly sports activity (in hours per week; average (SD)) of student non-members and members of sports clubs (data from the present study), and for primary- and secondary school children (data from (1)); year of research study is also presented for each category.*

Tabela 1. *Količina tedenske športne aktivnosti (v urah na teden; povprečje (SD)) študentov nečlanov in članov športnih klubov (podatki iz pričujoče raziskave) in mlajših mladostnikov iz osnovne in srednje šole (podatki iz (1)); za večjo preglednost je za vsako kategorijo predstavljeno tudi leto raziskave.*

	Age (years)	Non-members of sports clubs (h/week)	Members of sports clubs (h/week)	Significance (non-members vs. members)
Students (2011)	20 (0.8)	4.6 (3.0)	11.7 (6.8)	p<0.0001
Secondary school children (2007)	17 (0.6)	2.9 (2.9)	10.6 (4.6)	p<0.001
Primary school children (2007)	12 (0.4)	3.9 (4.1)	8.9 (5.2)	p<0.001

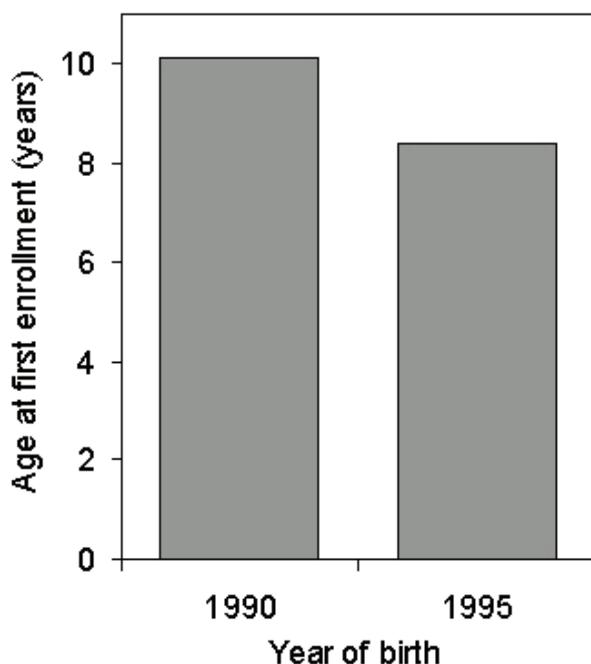


Figure 2. *The age of children at their first enrolment into a sports club according to their year of birth. Data combined from the present study and from (1).*

Slika 2. *Starost mladostnikov ob njihovi prvi včlanitvi v športni klub glede na njihovo leto rojstva. Podatki so kombinirani iz pričujoče študije in iz (1).*

4 DISCUSSION

The present study demonstrated that on average student members of sports clubs are almost two and a half times more active in sports per week than their peers. This difference is similar to that previously reported by other studies (1) in primary school children, namely, of the difference in average weekly sports activity of 12 year old members and nonmembers of sports clubs. The observed difference is somewhat smaller than the difference in weekly sports activity observed between 17 year old children members and non-members, where members were reported to be three and a half times more active than their non-member peers (1).

The combination of the results of the present study and previous results obtained in children and adolescents (1) demonstrates that the majority of sports club members, regardless of age, are active in sports at least one hour per day, which is in line with the existing recommendations (16, 17). In contrast, students and children who are non-members of sports clubs on average fail to fulfil this criterion. This conclusion is valid even considering the fact that the study on children and adolescents (1) was performed in the region of Northern Primorska, which is often believed to be above the Slovenian average for sports activity in children. The present study therefore demonstrates that similar to younger children (1), sports clubs in Slovenia are

important promoters of regular sports activity also in students.

One could speculate on whether sports club members are more active than their peers because they are members of a sport club, or whether they are members of a sports club because they are more active; an almost similar level of free time activity of both members and non-members suggests that the former is indeed true. In addition to the Slovenian HBSC studies performed on a nationally representative sample of 11 to 15 year old children in 2002 and 2010 (6, 27), which demonstrated that younger children more often fulfil the existing weekly criteria for sports activity than older children, our study further extended these results to the student population. Namely, the present study confirmed that the proportion of young individuals that are active in sports significantly decreases with age, as fewer students are included in sports clubs than children in primary and secondary school. This may be a result of the more sedentary lifestyle of students and less free time during university studies than in childhood. It may also be that students participate more often in other types of extracurricular activities that are, for example, more closely associated with their future profession. Furthermore, economic status may also reduce the participation of students in sports clubs. Namely, although studies report that children from families with low income benefit more from extracurricular participation than their peers (4), and although enrolment in sports clubs is usually free of charge as the majority of sports clubs in Slovenia perform their activities on a voluntary basis, organised sports activities outside sports clubs require the payment of monthly fees. Furthermore, higher living costs associated with university studies may reduce the capability of students to purchase specific sports equipment, as compared to children.

The results of the present study also demonstrated that it is worth paying attention to the gender structure of sports club members. Namely, regardless of age, females participated significantly less often in sports clubs than males. This result is in accordance with several cross-national studies within the WHO HBSC scheme (31-33), which detected this issue on different occasions. According to the existing reports (26), females seem to prefer other extracurricular activities more than sports, for example music or language learning. When it comes to sports activities, however, it has also been reported that females prefer to engage in non-competitive sports (26). In contrast to males, who usually report participation in more vigorous exercise activities, both outside of school and during school sports education, as well as higher participation in sports

teams, females usually report participation in activity-related lessons and classes (28, 29). Furthermore, in contrast to males, who engage in sport either for social reasons, because they have fun or because they like competition, females seem to place more focus on the shape of their body and self-image (30).

It may therefore be speculated that the existing sports clubs programs are exceedingly competitively oriented and do not provide sufficient learning motivation, which in turn decreases the inclusion of females. It has to be noted that the existing organised sports activities for children were developed in the past by, and consequently for, males (26). This may well be the reason why sports activities remain rather male-dominated, which makes them less attractive for females (26). In order to stimulate the inclusion of young females into sports clubs, it is therefore proposed that sports clubs could and should improve their programs by offering less competitive sports activities for children, which would target and thus more successfully attract females in the juvenile population.

At this point, it seems reasonable to stress that the Biotechnical Faculty and the Faculty of Education, from which the students of the present study were recruited, usually enrol larger numbers of females than males. This resulted in a better representation of females than males in the student sample of the present study. It is thus recommended that future studies are extended to faculties that predominantly enrol males in their study programs in order to improve the representativity of the conclusions for the male student population. In addition, students who participated in the present study came from all over Slovenia and thus had different sports backgrounds. This enabled us to embrace a significant heterogeneity of the student population. Nevertheless, using the same approach as presented above, thus recruiting also students from faculties that enrol predominantly male students to future studies would enable depicting student heterogeneity even further.

In addition, although this was not the aim of the present study and therefore the corresponding data were not collected, other studies (34) have demonstrated that factors such as time of the year may affect the amount of sports activities in children. Namely, children seem to participate more often, both in organised and non-organised sports activities, during spring and summer months, and less often in autumn and winter (34). Thus, apart from gender, other factors including multicomponent combinations, such as school-based interventions and family involvement (35), also need to be considered when planning and developing optimal sports activities for children.

Last, but not least, the age at first enrolment into sports clubs of students was significantly higher than that of younger children. As the number of sports club members was similar in the compared age groups, one can reasonably expect that any selection bias that might have affected this conclusion was avoided. It thus seems that sports clubs aim to attract younger and younger children, likely to improve their selection possibilities, which goes well in line with the competitively oriented programs. This can be, however, rather unfavourable for both the sports development of children, as it can increase the injury rate (36), and for psychological development, because of stimulated rivalry and requirement for victory at a very young age. Furthermore, participation in highly competitive extracurricular activities has already been shown to increase anxiety and stress levels (4).

5 CONCLUSION

The present study demonstrated that the role of sports clubs in promoting sports activity in students is undoubtedly beneficial. At the same time, however, other important issues have been emphasised, namely low percentage of student members of sports clubs, lower inclusion of females, and earlier first enrolment into sports clubs in younger generations.

As the results of the present study demonstrated that the average levels of weekly sports activity are low at university, specifically for sports club non-members, strategies and programs for increasing sports activity at university should be aimed to attract more students. Furthermore, a lower enrolment of females into sports clubs as compared to males suggests that strategies and programs for increasing sports activity among students should be gender specific. It is recommended that participation in sports clubs can be made more attractive for females in particular by planning and emphasising sports activity as healthful and enjoyable social gatherings and not as a competitive, athletic, performance-related program.

Lastly, it is suggested that students should be attracted to multiple activities, which will decrease effectiveness in each particular sports discipline but will also ensure a harmonising development and whole body agility (4). Such a change of programs, however, would also require an alternative scheme of sports clubs funding, as sports clubs are most often funded according to the sponsorship schemes, but the latter are directly related to competitive results of sports club members.

Acknowledgements

We are grateful to all the volunteers for the information they provided.

Conflicts of interest

None declared.

References

1. Golja P, Sterlinko-Grm H, Stubelj Ars M, Besednjak-Kocijancic L. Physical activity of children and adolescents, who do or do not participate in sports clubs. *Zdrav Vestn* 2009; 78: 225-30.
2. Malina RM, Little BB. The present in the context of the past. *Am J Hum Biol* 2008; 20: 373-91.
3. The Sedentary Behaviour & Obesity Expert Working Group. Sedentary behaviour and obesity: review of the current scientific evidence. London: Department of Health, 2010: 1-126.
4. Fredricks JA, Eccles JS. Is extracurricular participation associated with beneficial outcomes?: concurrent and longitudinal relations. *Dev Psychol* 2006; 42: 698-713.
5. Pišot R, Fras Z. Some characteristics of the health enhancing motor/sports activity behaviors in the slovene population. In: Milanović D, Prot F, editors. 4th International Scientific Conference on Kinesiology, Opatija, Croatia, September 7-11, 2005. Science and profession - challenge for the future: proceedings book. Zagreb: Faculty of Kinesiology, University of Zagreb, 2005: 270-6.
6. Stergar E, Scagnetti N, Pucelj. Telesna dejavnost: z zdravjem povezano vedenje. Ljubljana: Inštitut za varovanje zdravja RS, 2006: 54-61.
7. Telama R, Yang X, Viikari J, Valimaki I, Wanne O, Raitakari O. Physical activity from childhood to adulthood: a 21-year tracking study. *Am J Prev Med* 2005; 28: 267-73.
8. Wrotniak BH, Epstein LH, Dorn JM, Jones KE, Kondilis VA. The relationship between motor proficiency and physical activity in children. *Pediatrics* 2006; 118: 1758-65.
9. Stodden DF, Goodway JD, Langendorfer SJ, Roberton MA, Rudisill ME, Garcia C, Garcia LE. A developmental perspective on the role of motor skill competence in physical activity: an emergent relationship. *Quest* 2008; 60: 290-306.
10. Telama R, Yang X, Laakso L, Viikari J. Physical activity in childhood and adolescence as predictor of physical activity in young adulthood. *Am J Prev Med* 1997; 13: 317-23.
11. Telama R, Yang X. Decline of physical activity from youth to young adulthood in Finland. *Med Sci Sport Exer* 2000; 32: 1617-22.
12. Okely AD, Booth ML, Patterson JW. Relationship of physical activity to fundamental movement skills among adolescents. *Med Sci Sports Exerc* 2001; 33: 1899-1904.
13. Hills AP, King NA, Armstrong TP. The contribution of physical activity and sedentary behaviours to the growth and development of children and adolescents: implications for overweight and obesity. *Sports Med* 2007; 37: 533-45.
14. Pišot R, Zorc J. Influence of out-of-school sports/motor activity on school success. *Kinesiol Slov* 2003; 9: 42-54.
15. Planinsec J, Pisot R. Motor coordination and intelligence level in adolescents. *Adolescence* 2006; 41: 667-76.
16. Eithsdottir ST, Kristjansson AL, Sigfusdottir ID, Allegrante JP. Trends in physical activity and participation in sports clubs among Icelandic adolescents. *Eur J Public Health* 2008; 18: 289-93.

17. Strong WB, Malina RM, Blimkie CJ, Daniels SR, Dishman RK, Gutin B et al. Evidence based physical activity for school-age youth. *J Pediatr* 2005; 146: 732-7.
18. Strel J, Kovač M, Starc G, Jurak G. Spremembe v motoričnem razvoju otrok in mladine v Sloveniji v letih 1990-2000. *Šport* 2003; 51: 3-10.
19. Drev A. Trendi v telesni dejavnosti in gledanju televizije. In: Jeriček Klanšček H, Koprivnikar H, Zupanič T, Pucelj V, Bajt M, editors. Spremembe v vedenjih, povezanih z zdravjem mladostnikov v Sloveniji v obdobju 2002-2010. Ljubljana: Inštitut za varovanje zdravja RS, 2012: 143-56.
20. Majerič M, Strel J, Tušak M. Spremembe pri ukvarjanju s posameznimi športi pri študentih Univerze v Ljubljani v obdobju od 1979 do 2001. In: Berčič H, editor. Zbornik 3. slovenskega kongresa športne rekreacije, Otočec, 21.-22.11. 2002. Ljubljana: Olimpijski komite Slovenije, 2002: 80-5.
21. Kolar E, Cerar K, Piletič S, Svetlik I, Kugovnik O. Analysis of some aspects of the sports activity of University of Ljubljana students. *Šport* 2009; 57: 20-7.
22. Markelj N, Majerič M, Kovač M, Pučnik B. Nekateri značilnosti ukvarjanja s športom pri študentih Univerze v Mariboru in Univerze v Ljubljani. In: Berčič H, editor. Zbornik 3. slovenskega kongresa športne rekreacije, Otočec, 21.-22.11. 2002. Ljubljana: Olimpijski komite Slovenije, 2002: 86-95.
23. Majerič M, Strel J, Tušak M, Kovač M. Nekateri spremembe ukvarjanja s športom pri študentih Univerze v Ljubljani v obdobju od 1979 do 2001. *Šport* 2002; 50: 51-8.
24. Majerič M, Markelj N. Analysis of some factors of students' engagement in sport. *Šport* 2009; 57: 14-7.
25. Scagnetti N. Telesna dejavnost. In: Jeriček H, Lavtar D, Pokrajac T, editors. Z zdravjem povezano vedenje v šolskem obdobju. Ljubljana: Inštitut za varovanje zdravja Republike Slovenije, 2007: 53-63.
26. Kjonniksen L, Anderssen N, Wold B. Organized youth sport as a predictor of physical activity in adulthood. *Scand J Med Sci Spor* 2008; 1-9.
27. Drev A. Telesna dejavnost in sedeča vedenja. In: Jeriček Klanšček H, Roškar S, Koprivnikar H, Pucelj V, Bajt M, Zupanič T, editors. Neenakosti v zdravju in z zdravjem povezanih vedenjih slovenskih mladostnikov. Ljubljana: Inštitut za varovanje zdravja RS, 2011: 174-89.
28. Sallis JF, Zakarian JM, Hovell MF, Hofstetter CR. Ethnic, socioeconomic, and sex differences in physical activity among adolescents. *J Clin Epidemiol* 1996; 49: 125-34.
29. Jurak G, Kovač M, Strel J, Majerič M. Športna dejavnost študentov Univerze v Ljubljani med poletnimi počitnicami. In: Berčič H, editor. Zbornik 3. slovenskega kongresa športne rekreacije, Otočec, 21.-22.11.2002. Ljubljana: Olimpijski komite Slovenije, 2002: 96-103.
30. Michaud PA, Narring F, Caudey M, Cavadini C. Sports activity, physical activity and fitness of 9- to 19-year-old teenagers in the canton of Vaud (Switzerland). *Schweiz Med Wschr* 1999; 129: 691-9.
31. Cabak A, Woyrnarowska B. Physical activity of youth aged 11-15 years in year 2002 in Poland and other countries. *Physical Educ Sport* 2004; 4: 361-5.
32. Inchley JC, Currie DB, Todd JM, Akhtar PC, Currie CE. Persistent socio-demographic differences in physical activity among Scottish schoolchildren 1990-2002. *Eur J Pub Health* 2005; 15: 386-8.
33. Nichol M, Pickett W, Janssen I. Associations between school recreational environments and physical activity. *J School Health* 2009; 79: 247-54.
34. Santos MP, Matos MG, Mota J. Seasonal variations in Portuguese adolescents' organized and non-organized physical activities. *Pediatric Exercise Science* 2005; 17: 390-8.
35. van Sluijs EM, McMinn AM, Griffin SJ. Effectiveness of interventions to promote physical activity in children and adolescents: systematic review of controlled trials. *Br J Sports Med* 2008; 42: 653-7.
36. Besednjak-Kocijancic L, Sterlinko-Grm H, Arsenijevic M, Golja P. Sports injuries in Children and adolescents from the Northern Primorska region (in Slovene). *Slov Pediatr* 2009; 16: 242-8.