

Research article/Raziskovalni prispevek

PHYSICAL ACTIVITY OF CHILDREN AND ADOLESCENTS, WHO DO OR DO NOT PARTICIPATE IN SPORTS CLUBS

TELESNA DEJAVNOST OTROK IN MLADOSTNIKOV, KI SO OZ. NISO VKLJUČENI V ŠPORTNE KLUBE

Petra Golja,¹ Helena Šterlinko-Grm,² Mojca Arsenijevič,²
Lilijana Besednjak-Kocijančič³

¹ Ulica Prekomorskih brigad 12, 5220 Tolmin

² Univerza v Novi Gorici, Vipavska 13, 5000 Nova Gorica

³ Zdravstveni dom Nova Gorica, Rejčeva 4, 5000 Nova Gorica

Abstract

Background	<i>Physical activity during childhood and adolescence is beneficial for health and positive physical, mental, and emotional development. Similar to Scandinavian countries, voluntary physical activities in Slovenia are often organised by sports clubs.</i>
Methods	<i>The present study assessed, what is the proportion of children and adolescents who participate in sports clubs, how physically active children and adolescents, both, members and non-members of sport clubs are, and whether the weekly amount of physical activity differs between children and adolescents.</i>
Results	<i>43% of children and less ($P < 0.01$), 28% of adolescents were members of sports clubs. 54% of the boys were members of sports clubs in the primary, and significantly less ($P < 0.01$), 38%, in the secondary school. These values were significantly lower for girls, for both, primary (31%) ($P < 0.001$) and secondary school (21%) ($P < 0.001$). The average weekly physical activity of sports club members was 9.2(5.0) h/week in children and 10.6(4.6) h/week for adolescents, and was significantly lower for their peers non-members, with 5.0(3.9) h/week and 3.6(2.8) h/week, respectively. Among sports club members, 28% of children participated in sports competitions ten to thirty times, and 24% of adolescents more than thirty times per year.</i>
Conclusions	<i>The majority of children and adolescents, members of sport clubs, fulfil the current recommendations of at least one hour of physical activity daily. Several children and especially adolescents, non-members, do not. It is worrying, that members of sports clubs compete (too) often and that the extent of sport trainings is not properly adjusted. Small involvement of girls in sport clubs is also alarming.</i>
Key words	<i>physical activity; children; adolescents; sport clubs; sports activity; sport</i>

Izvleček

Izhodišča	<i>Telesna dejavnost je dokazano koristna za zdravje ter ustrezen telesni, psihološki in čustveni razvoj otrok in mladostnikov. V Sloveniji, podobno kot v skandinavskih državah, prostovoljne športne dejavnosti poleg šol največkrat organizirajo športni klubi, zato igrajo pomembno vlogo pri ohranjanju zdravja otrok in mladostnikov.</i>
Metode	<i>Pričujoča raziskava je na področju severne Primorske preverila, kolikšen delež otrok in mladostnikov je vključen v organizirane dejavnosti športnih klubov, kolikšen je obseg nji-</i>

Corresponding author / Avtor za dopisovanje:

Dr. Petra Golja, tel. 0590 / 16 263, 040 807 681, e-mail: petra_golja@t-2.net

hove tedenske telesne dejavnosti in kako se razlikuje količina tedenske telesne dejavnosti med člani in nečlani športnih klubov.

Rezultati

Od 818 otrok in mladostnikov je bilo v osnovni šoli v športne klube vključenih 43 % otrok, v srednji šoli pa le še 28 % mladostnikov ($P < 0,01$). V osnovni šoli je bilo glede na ostale sovrstnike istega spola v športne klube vključenih 54 % fantov in značilno ($P < 0,001$) manj, le 31%, deklet. V srednji šoli je bila ta vrednost za oba spola značilno nižja in je za fante znašala 38 %, za dekleta pa značilno ($P < 0,001$) manj, le 21 %. Skupna povprečna tedenska telesna dejavnost pri osnovnošolcih, članih športnih klubov, je bila 9,2 (5,0) ur/ teden, pri sovrstnikih nečlanih pa 5,0 (3,9) ur/ teden ($P < 0,01$). Pri srednješolcih članih je bila ta vrednost 10,6 (4,6) ur/ teden, pri sovrstnikih nečlanih pa 3,6 (2,8) ur/ teden ($P < 0,01$). Med člani športnih klubov se je 28 % osnovnošolcev udeleževalo športnih tekmovanj med 10- in 30-krat letno, 24 % srednješolcev pa več kot 30-krat letno.

Zaključki

Večina otrok in mladostnikov, članov športnih klubov, dosega obstoječa priporočila o vsaj eni uri telesne dejavnosti na dan. Precej otrok in še zlasti mladostnikov, ki v športne klube niso vključeni, teh priporočil ne dosega. Pri članih športnih klubov sta zaskrbljujoča zlasti pogostost športnih tekmovanj in neprilagojenost obsega treningov. Zaskrbljujoča je tudi bistveno slabša vključenost deklet v organizirano dejavnost športnih klubov.

Ključne besede *telesna dejavnost; otroci; mladostniki; športni klubi; gibalna dejavnost*

Introduction

Physical activity has been proved beneficial for health and positive physical, mental, and emotional development of children and adolescents.¹ Children who are physically active often receive higher grades at school.² Regular organised physical activity of children and adolescents also involves organised socialisation with their peers, which enables children and adolescents to learn sports as well as social skills that they can use in their everyday life. A better social inclusion has been proved to improve self-esteem, self-confidence and to decrease the feelings of boredom and alienation. Regular physical activity enables the children and adolescents to successfully control their aggression, and a better organisation and structure of their free time prevents them against negative behavioural patterns.^{1,3} Children and adolescents, who are regularly physically active, demonstrate a better motor control as compared to their peers, and can successfully maintain optimal body mass. It has also been proved that physical activity in childhood and adolescence, which lasts regularly for several years, positively affects the amount of physical activity in adulthood.^{4,5} Lack of physical activity is soon reflected in well-being and health. Sedentary way of life causes the children and adolescents to become overweight and obese.⁶⁻⁹ Excessive body mass can induce several chronic health conditions, such as muscle and skeletal system injuries, increased blood pressure, and diabetes, therefore a sufficient amount of physical activity is indispensable for the prevention of illnesses and other health conditions. It has been proven that regular physical activity decreases the risk of cardio-vascular diseases, therefore it is expected that any, even a rather small increase in the amount of physical activity, may be beneficial.¹⁰ It is therefore alarming that the number of children and adolescents in Slovenia, who are physically active for at least one hour daily at least five times

per week has decreased for 7.1 % in boys and 2.7 % in girls in four years only (2002–2006).¹¹

The organisation of voluntary sports activities in Slovenia is similar to that in Scandinavian countries,^{4,12} because, apart from the extra-curricular school programmes, organised sports activities for children and adolescents are being organised by sports clubs, which 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 the schools and universities.

The aim of the present study was to assess: (a) how many children and adolescents take part in organised sports activities of sports clubs, (b) what is the amount of weekly physical activity in children and adolescents, both, members and non-members of sports clubs, and (c) whether the amount of weekly physical activity of both, members and non-members of sports clubs, differs between children and adolescents.

Methods

The present study was performed in the Slovenian region of North Primorska, including the area from towns of Bovec to Vipava. The managements of 20 primary and 12 secondary schools were invited to participate in the study. The schools which gave consent for participation were provided with the questionnaires for the parents of children enrolled in the seventh year of primary schools (12-year old children) and in the third year of secondary schools (17-year old adolescents). The questionnaires, almost 1900 altogether, were distributed to the parents by class teachers or school psychologists at regular school meetings, or to the children who were asked to take the questionnaires to their parents and bring the completed back to school. All the questionnaires were anonymous and each of the parents could decide voluntarily whether

they would participate in the study or not. It is expected that at least some of the adolescents completed the questionnaires on their own. The questionnaire and the study protocol were approved by the Ethics Committee of the Republic of Slovenia.

The completed questionnaires have first been digitalised and then analysed on a personal computer using a Microsoft Office Excel 2003 (Microsoft Corporation, USA) program. The statistical analysis for the majority of data was performed by χ^2 test, the amount of weekly physical activity between the groups was compared by factorial analysis of variance for independent samples. The level of statistical significance was set to 0.05

Results

Completed questionnaires were obtained from 818 children and adolescents, of whom 495 children (61 %) were enrolled in the seventh year of the primary school and 323 adolescents (39 %) in the third year of the secondary school; the response level to the questionnaire was thus approximately 43 %. The gender structure of children and adolescents, whose data were included in the study, is presented in Table 1.

Table 1. *Gender of children and adolescents whose data were used in the study.*

* *Gender information was not provided in 1 % of the questionnaires.*

Tab. 1. *Zastopnost po spolu med otroki in mladostniki, vključenimi v raziskavo.*

* *V 1 % anket podatek o spolu ni bil označen.*

		Girls / Dekleta	Boys / Fantje
Primary school Osnovna šola	495	244 49 %*	248 50 %
Secondary school Srednja šola	323	193 60 %	130 40 %
Total Skupaj	818		

43 % of children (212 of 495 children), and only 28 % of adolescents (89 of 323 adolescents) were members of sports clubs; compared to children, the inclusion

of adolescents into the sports clubs was significantly lower ($P < 0.01$). Almost a quarter (24 %) of 301 children and adolescents, who were members of sports clubs, trained football or futsal, 16 % basketball, 9 % martial arts, 8 % handball, 7 % dancing, 5 % volleyball, 3 % athletics, 3 % baton twirling, 2 % horse riding, and less than 2 % of the children trained in each one of the other sports disciplines (skiing, gymnastics, table tennis, swimming, paddling/kayaking, roller-skating...). Compared to available data from the Scandinavian countries, the participation of children in organised activities of sports clubs in Slovenia was considerably lower as compared to Norway¹² and somewhat higher than in Iceland¹³ (Table 2).

Although the gender structure within sports club members was similar ($P > 0.05$) for primary school children and secondary school adolescents, the inclusion of girls into the sports clubs was significantly lower than that of boys, for both, children ($P < 0.001$) and adolescents ($P < 0.001$). Namely, compared to the peers of the same gender, more than half of the boys (54 %) were members of sports clubs in primary school, but only a third of girls (31 %). Similarly, a third of the boys (38 %) were members of sports clubs in the secondary school, but only a quarter of girls (21 %). The percentage of children, members of sports clubs, significantly decreased with age with both, girls ($P < 0.05$) and boys ($P < 0.01$).

On average (SD), children, who were not members of sports clubs, were physically active 5.0 (3.9) hours per week in their free time, and adolescents 3.6 (2.8) hours per week. Children, who were members of sports clubs, were physically active 4.6 (3.6) hours per week in their free time, and have also performed 5.4 (2.9) hours of organised sports trainings per week. The average cumulative physical activity of children, members of sports clubs was 9.2 (5.0) hours per week and was thus almost two times higher ($P < 0.01$) than the weekly physical activity of their peers. Adolescents, who were members of sports clubs, were physically active 3.9 (3.2) hours per week in their free time, and have also performed 7.2 (4.3) hours of organised sports trainings per week. The average cumulative physical activity of adolescents, members of sports clubs was 10.6 (4.6) hours per week and was thus almost three times

Table 2. *The percentage of girls and boys of different age participating in sports club activities in Norway, Slovenia and Island. Data for Norway from Kjonniksen et al. (2008), for Island from Eidsdottir et al. (2008), and for Slovenia from the present study.*

* *Significantly ($P < 0.001$) smaller when compared to boys of the same age.*

Tab. 2. *Vključenost v športne klube glede na spol, starost in državo. Podatki za Norveško iz Kjonniksen in sod. (2008), za Islandijo iz Eidsdottir in sod. (2008) in za Slovenijo iz pričujoče raziskave.*

* *Značilno ($P < 0.001$) nižje kot pri fantih iste starosti.*

	Norway Norveška		Slovenia Slovenija		Island Islandija	
	Age (years) Starost (let)	Percentage of children (%) Delež otrok (%)	Age (years) Starost (let)	Percentage of children (%) Delež otrok (%)	Age (years) Starost (let)	Percentage of children (%) Delež otrok (%)
Girls / Dekleta	13	59	12	31*	14 and/in 15	27
Boys / Fantje	13	66	12	54	14 and/in 15	36
Girls / Dekleta	18	31	17	21*	/	/
Boys / Fantje	18	47	17	38	/	/

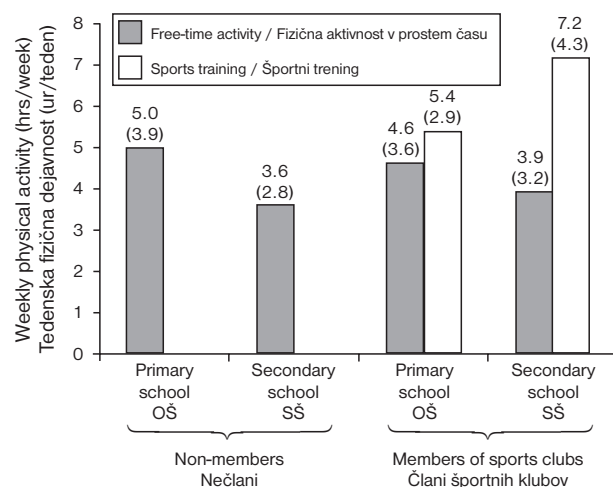


Figure 1. Average (SD) weekly physical activity in primary school children (OŠ) and secondary school adolescents (SŠ), who are members or non-members of sports clubs. Data represent the physical activity of children and adolescents in their free time (full columns) and, for sports club members, during organised sports trainings (open columns). Data do not include obligatory school class sports activity.

Sl. 1. Povprečna tedenska fizična aktivnost pri osnovnošolcih (OŠ) in srednješolcih (SŠ), ki so ali niso člani športnih klubov. Podatki predstavljajo dejavnost otrok in mladostnikov v prostem času (temni stolpci) in pri članih športnih klubov med športnimi treningi (svetli stolpci), ne vključujejo pa fizične aktivnosti pri obvezni šolski telovadbi.

higher ($P < 0.01$) than the weekly physical activity of their peers (Figure 1).

More than half (53 %) of children members of sports clubs participated in sports competitions up to ten times per year, 28 % of children members up to thirty times per year, and 8 % of children members more than thirty times per year (12 % of answers were descriptive). Among adolescent members of sports clubs, the corresponding values are 44 %, 21 % and 24 %, respectively, with 11 % of answers being descriptive (Figure 2).

Discussion

The results of the present study demonstrate that sports clubs in the Slovenian region of North Primorska have an important role in enabling suitable weekly amounts of physical activity for children and adolescents. Namely, the amount of weekly physical activity in children, members of sports clubs, is almost two times higher than that of their peers, and in adolescents, members of sports clubs, the amount of physical activity is almost three times higher than that of their peers. In general, the majority of children and adolescents, members of sports clubs perform enough physical activity to fulfil the existing recommendations¹⁴ of at least one hour of physical activity per day. In contrast, several children and especially adolescents, who are not members of sports clubs, fail to fulfil this criterion.

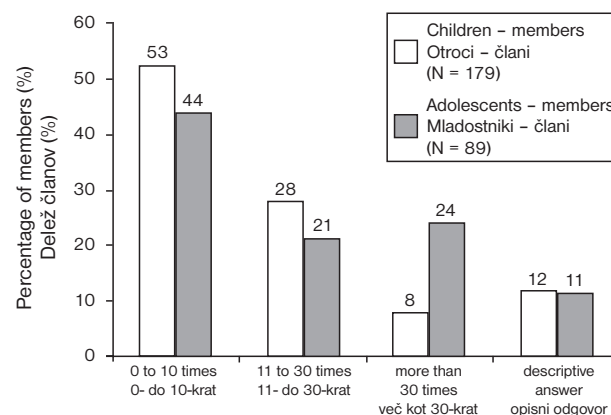


Figure 2. The frequency of participation (expressed as a percentage of members of sports clubs) of primary school children (open columns) and secondary school adolescents (full columns) at sports competitions in one year. For example: 53 % of children, members of sports clubs, participate in sports competitions from 0 to 10 times per year.

Sl. 2. Pogostost udeležbe (izražena v odstotku članov športnih klubov) osnovnošolcev (svetli stolpci) in srednješolcev (temni stolpci) na športnih tekmovanjih v enem letu. Za primer: 53 % otrok, članov športnih klubov, sodeluje na športnih tekmovanjih 0 do 10-krat na leto.

The results of the present study demonstrate that the amount of voluntary physical activity among children and adolescents decreases with age, which is in agreement with other studies.^{3, 15} Similar to other reports that demonstrate that girls are on average less physically active than boys^{11, 16, 17} and that they seldomly participate in the organised activities of sports clubs,^{12, 13} the results of the present study demonstrate that the participation of girls in the organised activities of sports clubs in Slovenia is significantly lower than that of the boys. Although these results can not be directly transferred to the adult population, the studies demonstrate that the likelihood for insufficient physical activity in adulthood is higher in women than in men.¹⁸ It has also been reported that girls prefer to participate in activities with low and middle-level intensity and in non-competitive sports activities.¹⁹ It is therefore suggested that a special attention should be made when organising sports activities, so as to promote the participation of girls.

In contrast to the recommendations of the Norwegian national sports association, which encourages the development of sport skills through playing and participation in exclusively non-competitive sports activities in all children younger than 11 years,¹² the results of the present study demonstrate that almost 30 % of twelve year old children, members of sports clubs in Slovenia, participate in sports competitions from ten to thirty times per year. Even more, a quarter of adolescents, members of sports clubs compete almost every week (30 or more times per year). Furthermore, it is rather worrying that the weekly amount of organised sports trainings is almost similar for twelve

year old children (5.4 h/week) and seventeen year old adolescents (7.2 h/week), despite a significantly different level of physical and mental development between the two groups, which suggest that sports trainings may not be adequately tailored to specific needs of the children.

It is generally accepted that intensive physical training induces physical, psychological and metabolic stress, which can lead to overtraining syndrome. The overtraining syndrome causes emotional problems, hormone imbalance, behavioural changes with lack of enthusiasm or increased irritation, decreased immune function and, among the others, a decrease in physical strength and performance.²⁰ Such condition may be especially dangerous with children and adolescents, due to their ongoing growth and development.

Inappropriate and too intensive sports trainings can cause different injuries in muscular and skeletal system. Especially recurrent sports injuries can result in permanent damage to musculoskeletal system,^{21, 22} which have an undoubtedly negative effect on health and well being of children and adolescents, as well as on their further growth and development.

In children and adolescents, the learning of sports and social skills through playing and non-competitive sports activities instead of competitive sports achievements should be promoted, and the existing good practices and recommendations¹² should be followed. When promoting physical activity in children and adolescents, sports instructors, coaches, teachers, and parents should primarily focus on health (improved self-esteem, prevention of illnesses), ethical («fair play», equality of genders), and social benefits (respect of differences, inclusion of marginalised groups, team work) of physical activity, instead of focusing on the sports achievement *per se*. The latter can only be used as guidance for enduring and improving the sports skills of the most successful, physically, mentally, and emotionally developed individuals.

Conclusions

The results of the present study suggest that in children membership in sport clubs doubles and in adolescents triples the amount of voluntary weekly physical activity, which successfully fulfils the existing criteria of recommended amounts of weekly physical activity. As the participation in organised activities of sports clubs enables not only the regular physical activity and learning of sport skills, but also enables socialisation and the adjoining psychological development, the sports clubs have an important role in the maintenance of health for children and adolescents.

It is rather worrying, however, that in contrast to the existing recommendations, children and adolescents in Slovenia very often participate in sports competitions. Also, the small differences in the amount of sports training for twelve year old children and seventeen year old adolescents can be a source of concern. Apart from the undoubtedly positive effects of physical activity, the coaches and sports instructors should pay attention also to the negative effects of long and intensive trainings, and burdens associated

with sports competitions in children and adolescents (hormone imbalance, reduced immune function, musculoskeletal overloading and psychological stress) in the sensitive period of growth, physical, mental, and emotional development.

Acknowledgements

We are deeply grateful to all the parents, children and adolescents for the information they provided. We most kindly thank all the headmasters, class teachers, and school psychologists, whose work was indispensable for this study. We also thank Mr. Marjan Pintar for his constructive comments with questionnaire preparation.

References

1. Fredricks JA, Eccles JS. Is extracurricular participation associated with beneficial outcomes? Concurrent and longitudinal relations. *Dev Psychol* 2006; 42: 698–713.
2. Pišot R, Zorc J. Influence of out-of-school sports/motor activity on school success: Vpliv izvenšolske gibalne/športne aktivnosti otrok na učni uspeh. *Kinesiol slov* 2003; 9: 42–54.
3. 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 Wochenschr* 1999; 129: 691–9.
4. Telama R, Yang X, Viikari J, Valimäki I, Wanne O, Raitakari O. Physical activity from childhood to adulthood: a 21-year tracking study. *Am J Prev Med* 2005; 28: 267–73.
5. Telama R, Yang X. Decline of physical activity from youth to young adulthood in Finland. *Med Sci Sports Exerc* 2000; 32: 1617–22.
6. 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.
7. Kriemler S, Manser-Wenger S, Zahner L, Braun-Fahrlander C, Schindler C, Puder JJ. Reduced cardiorespiratory fitness, low physical activity and an urban environment are independently associated with increased cardiovascular risk in children. *Diabetologia* 2008; 51: 1408–15.
8. Kelishadi R. Childhood overweight, obesity, and the metabolic syndrome in developing countries. *Epidemiol Rev* 2007; 29: 62–76.
9. Avbelj M, Saje Hribar N, Seher-Zupančič M, Brčar P, Kotnik P, Iršič A, et al. Prevalenca prekomerne prehranjenosti in debelosti med pet let starimi otroci in 15 oziroma 16 let starimi mladostniki in mladostnicami v Sloveniji. *Zdrav Vestn* 2005; 74: 753–9.
10. Fras, Z. Telesna dejavnost – varovalni dejavnik za zdravje srca in ožilja = Physical activity protects against cardiovascular diseases. *Zdrav vars* 2002; 41:20–6.
11. Scagnetti N. Telesna dejavnost. In: Jeriček H, Lavtar D, Pokrajac T, eds. *Z zdravjem povezano vedenje v šolskem obdobju*. HBSC Slovenija 2006. Ljubljana: Inštitut za varovanje zdravja Republike Slovenije; 2007. p. 53–63.
12. Kjønniksen L, Anderssen N, Wold B. Organized youth sport as a predictor of physical activity in adulthood. *Scand J Med Sci Sports* 2008; (v tisku).
13. Eithsottir 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.
14. 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.
15. Nader PR, Bradley RH, Houts RM, McRitchie SL, O'Brien M. Moderate-to-vigorous physical activity from ages 9 to 15 years. *JAMA* 2008; 300: 295–305.

16. Aarnio M, Winter T, Kujala U, Kaprio J. Associations of health related behaviour, social relationships, and health status with persistent physical activity and inactivity: a study of Finnish adolescent twins. *Br J Sports Med* 2002; 36: 360-4.
17. Koprivnikar H. Telesna dejavnost pri mladih v Sloveniji in v svetu. In: Kostanjevec S, Torkar G, Gregorič M, Gabrijelčič Blenkuš M, eds. *Zdrav življenjski slog srednješolcev: priročnik za učitelje*. Ljubljana: Inštitut za varovanje zdravja Republike Slovenije; 2005. p. 48-54.
18. Zaletel-Kragelj L, Fras Z, Maučec Zakotnik J. Results of CINDI health monitor surveys in Slovenia as a tool for development of effective healthy nutrition and physical activity intervention programmes. *J Public Health* 2006; 14: 110-8.
19. 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.
20. Meeusen R, Duclos M, Gleeson M, Rietjens G, Steinacker J, Urhausen A. Prevention, diagnosis and treatment of the overtraining syndrome. *Eur J Sport Sci* 2006; 6: 1-14.
21. Maffulli N. Intensive training in young athletes. The orthopaedic surgeon's viewpoint. *Sports Med* 1990; 9: 229-43.
22. Caine D, DiFiori J, Maffulli N. Physeal injuries in children's and youth sports: reasons for concern? *Br J Sports Med* 2006; 40: 749-60.

Arrived 2008-12-12, accepted 2009-04-13