

COMPARISON OF SUCCESS OF SLOVENIAN TOP LEVEL ATHLETES AT SENIOR AND JUNIOR COMPETITION LEVEL

Mitija SAMARDŽIJA PAVLETIČ¹, Iztok RETAR², Poljanka PAVLETIČ SAMARDŽIJA, Edvard KOLAR¹

¹University of Primorska, Faculty of Mathematics, Natural Sciences and Information Technology, Koper, Slovenia

²University of Primorska, Science and Research Centre, Institute for Kinesiology Research, Koper, Slovenia

Corresponding author:

Iztok RETAR

University of Primorska, Science and Research Centre, Institute for Kinesiology Research, Koper, Slovenia

e-mail: Iztok.Retar@zrs.upr.si

ABSTRACT

In this study, we examined whether the Slovenian athletes who are the holders of medals in major competitions in junior categories are among the winners of the most prestigious awards also in senior categories. On a sample of 192 elite sportsmen and sportswomen 98, who during the period from 1 January 2008 to 31 December 2013 achieved the positions from the first to the third place in selected Olympic disciplines in the biggest competitions at junior level competitions and at senior level competitions, we found a result dropout rate of athletes who achieved top results in junior categories after their transition to the senior category.

We found that the Slovenian athletes in senior competition level on average achieve top level results at the age of 27. Furthermore, we found out that a half (49 %) of the athletes who achieved excellent results in senior category had not achieved superb results earlier in junior category, and that almost 30 % of athletes who achieved their best results at major competitions on senior levels failed to obtain the status of an athlete of perspective class at the time when they competed in junior category. We have come to the conclusion that unlike the sportsmen achieving top results only a small group of sportswomen achieve top level results. We recommend a systemic analysis of expert professional work in individual sports, adoption of certain measures to improve the competencies of sports managers who coordinate the work of expert teams and the contribution of many other stakeholders who are co-creators of top sports achievements. In addition, we would further suggest the analysis of the categorisation system,

particularly in the area of determining the status of perspective athlete. We believe it would be wise to carry out a further in-depth research that would respond to the question who are the key stakeholders and how to influence them in order to reduce the result dropout rate of top young athletes in the transition period to senior categories and to increase the total number of top athletes.

Keywords: *sports management perspective/athletes, top level sport result, major competitions*

PRIMERJAVA USPEHOV SLOVENSКИH VRHUNSKIH ŠPORTNIKOV NA RAVNI ČLANSKE IN MLADINSKE REPREZENTANCE

POVZETEK

V raziskavi proučujemo, ali se slovenski športniki, ki so nosilci odličij na največjih tekmovanjih v mladinski kategoriji, uvrščajo tudi v članski kategoriji med dobitnike prestižnih odličij. Analizirali smo vzorec 192 vrhunskih športnikov in 98 športnic, ki so v obdobju od 1. 1. 2008 do 31. 12. 2013 dosegli uvrstitev v izbranih olimpijskih panogah od prvega do tretjega mesta na največjih tekmovanjih v mladinski in v članski konkurenci. Ugotovili smo rezultatski osip pri športnikih, ki so v mladinskih kategorijah dosegali vrhunske rezultate po prehodu v člansko kategorijo. Ugotovili smo tudi, da slovenski športniki v članski konkurenci v povprečju dosegajo vrhunske rezultate razmeroma pozno (pri sedemindvajsetih letih). Ugotavljamo še, da polovica (49 %) športnikov, ki so dosegli vrhunski rezultat v članski kategoriji, le-tega niso dosegli v mladinski kategoriji, skoraj 30 % športnikom, ki so dosegli vrhunski rezultat na največjih tekmovanjih v članski konkurenci, pa ni uspelo pridobiti statusa športnika perspektivnega razreda v času, ko so tekmovali v mladinski kategoriji. Ugotavljamo tudi, da za razliko od športnikov dosega vrhunske rezultate le majhna skupina športnic. Na podlagi ugotovitev predlagamo izvedbo systemske analize strokovnega dela po posameznih športnih panogah. Priporočamo tudi uvajanje ukrepov izboljšanja kompetentnosti športnih menedžerjev, ki koordinirajo delo strokovnega tima in drugih številnih deležnikov, ki so soustvarjalci vrhunskih športnih dosežkov. Prav tako še priporočamo analizo modela kategorizacije, zlasti na področju določanja statusa perspektivnega športnika. Predlagamo tudi nadaljnje poglobljene raziskave, ki bodo lahko odgovorile, kateri so ključni deležniki in kako vplivati nanje, da bomo zmanjšali

osip vrhunskih mladih športnikov pri prehodu v članske kategorije in povečali število vrhunskih športnic.

Ključne besede: športni menedžment, perspektivni športniki, vrhunski športnik, vrhunski rezultat, velika tekmovanja

INTRODUCTION

Slovenia is a sports prosperous country. It is true that it cannot compete in the absolute number of medals at major competitions with larger countries, but in relative numbers (number of medals per capita or in relation to GDP) Slovenia is among the best in the world. Even at the Winter Olympic Games Sochi 2014, Slovenia was placed, relatively speaking, according to the Bloomberg portal to the second place, just after Norway (Bloomberg, 2014). Other studies also estimate Slovenian sport as successful at the international level. Number of medals won at the biggest competitions, i.e., summer and winter Olympic Games and World and European Championships, shows a positive trend since Slovenia's independence (Grujič, 2013; Kolar, Bednarik, Kovač, & Jurak, 2007), which automatically increases the number of categorised athletes in both world and international class (Kolar & Rajšter, 2010). The document titled "Conditions, rules and criteria for the registration and categorization of athletes in the Republic of Slovenia" stipulates that each registered athlete who acquired the title of junior, national, prospective, international or world class is a categorised athlete. The same document also provides the status of categorized athlete, and in addition to the registration, among other conditions, it also defines the condition that athletes have to, in order to obtain categorisation with their sports achievements, meet at least one of the criteria for categorization of individual sports (in our case, the criteria for international and global class) ("Pogoji, pravila in kriteriji za registriranje in kategoriziranje športnikov v Republiki Sloveniji", 2013).

Analysis of the top results in junior category shows even a better situation because Slovenian young athletes reach a greater number of rankings among the winners of medals at the biggest junior category tournaments, compared to athletes in senior categories at the competitions of the same level. At the Youth Olympic Games (period 1993–2014) Slovenia was with its 17 medals (5 gold, 6 silver and 6 bronze) ranked to the 22nd place (absolute result) of a total of 114 countries ranked winning medals ("All-Time Youth Olympic Games medal table", 2014). High rankings of young athletes were also reflected in the increase of the number of athletes categorized "prospective class", which in the period from 2001 (179 prospective athletes) to 2009 (259 prospective athletes) grew on average by 5.5 % per year, or by 8.9 of athletes per year (Kolar & Kovac, 2010). A similar positive trend continued during the period 2010-2013. In his analysis, Grujič (2013) notes that comparatively between 2009 and 2010, there was an increase in the number of prospective athletes by 66 %. Such a leap was caused by the change of the categorization rules, which have been valid since 2009. In 2011 and 2012,

the increase was stable at an average of 9 %. In 2013 there was a decline in the number of prospective athletes by 1.5 %. Despite the negative trend in 2013, we found that the Slovenian young athletes are successful because in 2013 up to 510 athletes were recorded in the prospective class (Grujic, 2013). Individual analysis of existing sources indicates that the Slovenian athletes are successful in individual categories. We could not find comparable studies in the domestic and foreign literature. We assume that the reason for this lies in different systems of status rights enforcement and, thus, also in categorizing athletes; from that reason our research is specific.

The aim of the survey was to determine whether the Slovenian athletes, medal holders from the biggest competitions in senior category, also rank among the winners of medals at major competitions in junior category. We assumed, indeed, that the result dropout of athletes who in the junior category achieved top results is present in their transition to the senior category.

Therefore, we posed the following research questions:

- Are Slovenian athletes of junior or senior categories more successful at the biggest competitions?
- Did Slovenian athletes who in senior category achieved rankings among the top three in the biggest competitions achieve the same comparable rank in the junior category?
- Are the medal holders at the biggest competitions in the senior category the athletes who in the junior categories achieved mediocre results?

RESEARCH METHODS

The sample in the study is represented by the top Slovenian athletes (Table 1) who during the period from 1. 1. 2008 to 31. 12. 2013 achieved a ranking from the first to the third place in the biggest competitions at the junior competition level (World and European Youth Olympic Games, World and European Championships, Grand Slam in tennis) and in the senior competition level (Olympic Games, World and European Championships, Grand Slam in tennis), all in the Olympic sports.

Table 1: Basic characteristics of the sample

	Number of events	Number of athletes	Number of athletes JR*	Number of athletes SR**	Average age of athletes SR**
Men	246	192	148	44	27.75 (SD 6.59) years
Women	137	98	68	30	25.23 (SD 5.21) years
Total	383	290	216	74	

*JR – junior category; **SR – senior category

The study covered the athletes from the following sports:

- junior category: the stadium athletics, sailing, judo, kayaking and canoeing flatwater and slalom, road and mountain cycling, target archery, table tennis, volleyball, swimming, handball, skiing (alpine, snowboard, Nordic combined, ski jumping, cross-country skiing), taekwondo wtf, tennis, rowing.
- senior category: the stadium athletics, gymnastics, sailing, judo, kayaking and canoeing flatwater and slalom, mountain biking, target archery, table tennis, swimming, skiing (alpine, biathlon, snowboarding, ski jumping, cross-country skiing), shooting, taekwondo wtf, rowing.

Data sources were as follows:

- Web application “Athletes” - collection of information on the categorisation and the achievements of athletes (“Seznam kategoriziranih športnikov”, 2014)
- Olympic Committee of Slovenia – Association of Sports Federations (the OCS) – Sports Results (“Športne igre”, 2014)

Data obtained to look for answers have been elaborated by descriptive statistical parameters (frequency, average value, contingency table). Data processing was carried out with the software package SPSS and Microsoft Excel.

RESULTS

In the period 2008–2013, Slovenian athletes achieved in extremely numerous high-profile results in Olympic sports in all major competitions, and were ranked among the top three even up to 383 times (Figure 1). From these data it is evident that the junior category in the same period reached by 106 % more rankings among the top three in total in the selected competitions than athletes of senior category. At the same time, we have found out that given the total incidence of Slovenian athletes ranking among the top three in the selected competitions for women is up to 37 % and for men over 150 % more such achievements in junior category than in senior category (Figure 1).

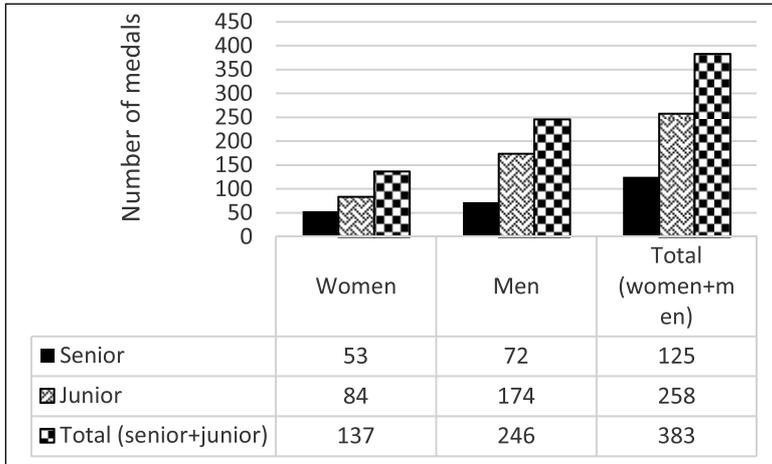


Figure 1: Number of Slovenian athletes' rankings from 1st to 3rd place in selected competitions given the category and gender in the period 2008–2013.

With reference to the overall incidence of 383 rankings among the top three in the selected competitions, we have found out that that men are more successful, reaching 80 % more rankings among the top three in the selected competitions compared to women (Figure 1). Number of rankings may be different from the number of athletes who have achieved such results, as one athlete in the monitored six-year period may have achieved that rank for several times. The data shown in Figure 2 determine the number of athletes who achieved ranking among the top three in the selected competitions in the period 2008–2013 at least once. The difference in the overall incidence of rankings (Figure 1) and the total incidence of athletes who have achieved at least one criteria classification (Figure 2), reaches up to more than 30 % in favour of the rankings.

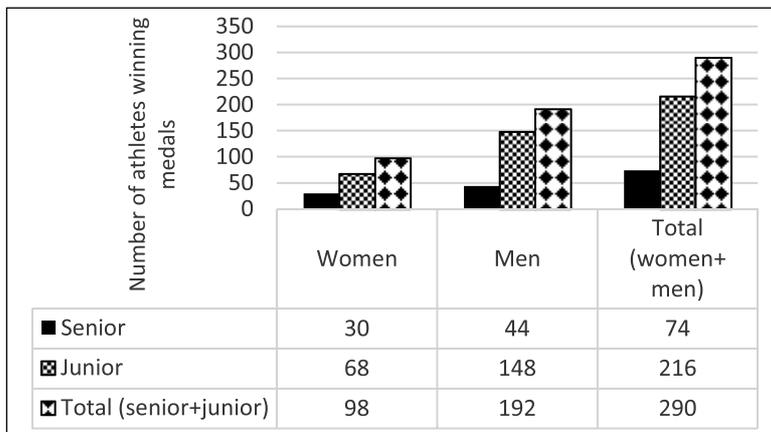


Figure 2: Number of athletes who reached rankings from the 1st to 3rd place at selected competitions in relation to the category and gender in the period 2008–2013.

We have learned that athletes of senior category ranked at selected competitions among the top for 125 times (Figure 1). The total number of athletes who achieved this rank is 74, which means that most athletes achieved top result several times (Figure 2). The figure is actually encouraging, because it tells us that Slovenian coaches know how to keep a top level professional athlete at the top level for a long period of time. From the data it is also evident that junior category achieved 191 % more rankings among the top three in the selected competitions than in the senior category. At the same time, we see that parallel to the total appearance of Slovenian athletes who were ranked among the top three in the selected competitions for women 127 % and for men 236 % there are more such events in junior rather than in senior category (Figure 2).

For easier understanding and identifying the level of sport development at the national level, it makes sense to analyse the sports in which the criteria results have been achieved. At the Summer Olympics, for example, 38 sports are included, and in Winter Olympic Games 15 sports (“Olimpijske športne panoge” 2014) which in total comes to 53 sports. Slovenian athletes have ranked among the top three in 23 Olympic sports at the biggest competitions in 2008–2013, which represents 43 % of the total number of Olympic sports.

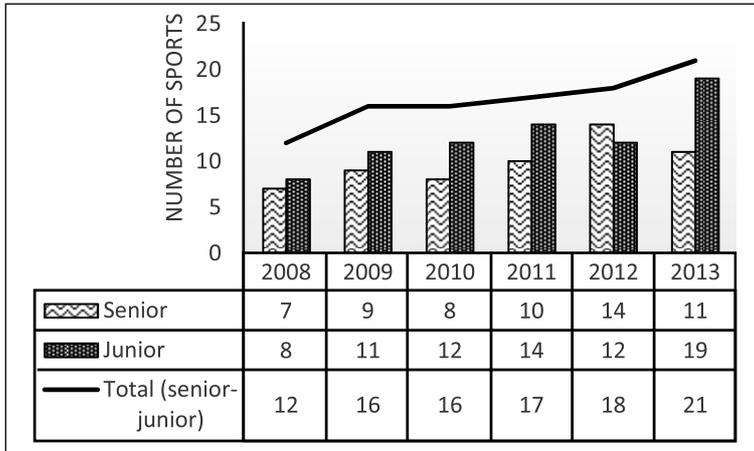


Figure 3: Number of sports in which athletes achieved ranking from 1st to 3rd place in selected competitions regarding the category, in the period 2008–2013.

The trend of increase in the number of sports in which Slovenian athletes achieve rankings from 1st to 3rd place in the selected competitions is positive (Figure 3). It is strongly positive in the junior competitions, which suggests that lower result performance in the senior category is not a reflection of the shortcomings of the expertise, but the restrictions may be found, according to our assumptions, elsewhere.

Table 2: Number of rankings from 1st to 3rd place in selected competitions of athletes in junior category by sports in the period 2008–2013.

Count – JUNIOR CATEGORY								
		Year of the achieved result					Total	
		2008	2009	2010	2011	2012		2013
NSF	ATHLETICS – STADIUM/TRACK AND FIELD	0	1	1	3	0	6	11
	SAILING	3	2	1	1	1	4	12
	JUDO	1	3	4	5	4	6	23
	KAYAK CANOE – FLATWATER	0	0	0	0	2	2	4
	KAYAK CANOE – SLALOM	5	7	4	2	7	9	34
	CYCLING – ROAD	0	0	1	1	2	1	5
	CYCLING – MOUNTAIN	1	0	1	0	0	1	3
	ARCHERY – TARGET	0	0	0	0	5	2	7
	TABLE TENNIS	0	0	1	0	0	4	5
	VOLLEYBALL	0	0	0	0	0	12	12
	SWIMMING	2	1	0	4	0	2	9
	HANDBALL	0	15	15	0	13	12	55
	SKIING – ALPINE	0	1	1	2	1	4	9
	SKIING – SNOWBOARD	1	1	0	3	0	1	6
	SKIING – NORDIC COMBINED	0	3	4	1	0	0	8
	SKIING – SKI JUMPING	1	4	3	1	7	10	26
	SKIING – CROSS COUNTRY	0	0	0	1	3	1	5
	TAEKWONDO – WTF	0	1	1	2	1	1	6
TENNIS	4	0	0	6	0	1	11	
ROWING	0	0	0	4	1	2	7	
Total		18	39	37	36	47	81	258

Table 3: Number of rankings from 1st to 3rd place in the selected competitions of athletes in senior category by sport in the period 2008–2013.

Count – SENIOR CATEGOTRY								
		Year of the achieved result					Total	
		2008	2009	2010	2011	2012		2013
NSF	ATHLETICS – STADIUM/TRACK AND FIELD	1	2	0	1	1	0	5
	SAILING	2	1	1	0	1	0	5
	JUDO	3	0	0	0	3	1	7
	KAYAK CANOE – FLATWATER	3	2	4	4	5	5	23
	KAYAK CANOE – SLALOM	0	0	0	0	1	1	2
	CYCLING – ROAD	0	3	8	4	1	4	20
	CYCLING – MOUNTAIN	0	0	0	1	1	2	4
	ARCHERY – TARGET	1	0	2	0	1	0	4
	TABLE TENNIS	0	1	0	1	0	0	2
	VOLLEYBALL	1	0	0	0	5	0	6
	SWIMMING	0	1	1	1	0	1	4
	HANDBALL	0	1	0	0	4	1	6
	SKIING – ALPINE	0	0	0	1	0	1	2
	SKIING – SNOWBOARD	0	0	0	4	1	1	6
	SKIING – NORDIC COMBINED	0	0	1	1	0	0	2
SKIING – SKI JUMPING	1	6	2	2	1	1	13	
SKIING – CROSS COUNTRY	0	0	1	0	1	2	4	
TAEKWONDO – WTF	0	4	0	0	6	0	10	
Total		12	21	20	20	32	20	125

The results emphasise the positive trend and growth in the number of sports, however, they also highlight deficiencies and poor participation in women's sports. One of the specific findings is the athlete's age in the senior category, who achieved ranking from 1st to 3rd place in the selected competitions. We have found out that Slovenian athletes in the senior competition level on average achieve top results at the age of 27.75 years (men) and 25.23 years (women), i.e., at the age of sports maturity. Along individual sports we noticed an unsystematic situation in achieving top results in the observed period (Table 2 and Table 3). The exception is judo (Figure 4).

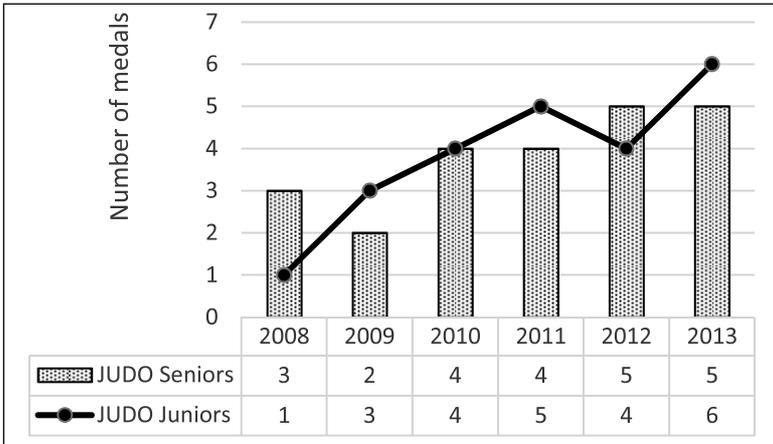


Figure 4: Example of good practice in judo.

A specific finding was the athlete’s age in senior category achieving the rank of 1st to 3rd place in selected competitions. We concluded that in senior category Slovenian athletes on average achieve top level results at the age of 27, i.e., in the period of sports maturity.

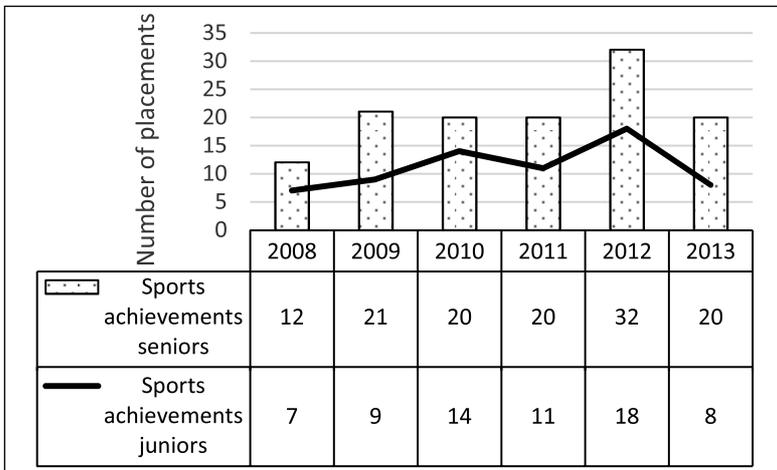


Figure 5: Comparison of rankings from 1st to 3rd place in the senior category with the junior category.

Below, we examine the relationship between the athletes who achieved top result in the senior category and their results success in the junior category. Figure 5 shows the number of rankings from 1st to 3rd place in the biggest competitions in the senior category for the period 2008–2013 and the number of athletes from the already mentioned who achieved comparable rank in junior category. For example, 12 athletes from senior category achieved top result in 2008, seven of which achieved a comparable result in the junior competition level. We have found out that a large number of athletes achieved their best results only in the senior competition level. After calculating separate proportions, we have found out that, on average, 47 % of top athletes who were in the senior category in the period 2008–2013 achieved the first three places. They did not achieve them at junior competition level (Figure 5). Why this phenomenon occurs, needs to be further investigated.

The data indicate that many young athletes get lost on their way to a top result at the senior competition level. Up to 49 % of athletes who achieved excellent results in senior category but were not superb in junior category; almost 30 % of the athletes who achieved top result in the biggest competitions at senior competition level, failed to obtain the status of a prospective athlete at the time when they were competing in junior category.

Table 4: Comparison of athletes' rankings by sports from 1st to 3rd place in senior category with junior category – the prospective class.

NSF – SPORT		Number of athletes NOT ACHIEVING prospective class	Number of athletes ACHIEVING prospective class
ATHLETICS – STADIUM/TRACK AND FIELD	f	1	1
	f%	50.0 %	50.0 %
GYMNASTICS – ARTISTIC	f	1	2
	f%	33.3%	66.7%
SAILING	f	3	2
	f%	60.0 %	40.0 %
JUDO	f	3	6
	f%	33.3 %	66.7 %
KAYAK CANOE – FLAT WATERS	f	0	1
	f%	0.0 %	100.0 %
KAYAK CANOE – SLALOM	f	1	10
	f%	9.1 %	90.9 %
CYCLING – MOUNTAIN	f	2	1
	f%	66.7 %	33.3 %
ARCHERY – TARGET	f	0	3
	f%	0.0 %	100.0 %
TABLE TENNIS	f	1	0
	f%	100.0 %	0.0 %
SWIMMING	f	0	5
	f%	0.0 %	100.0 %

SKIING — ALPINE	f	0	1
	f %	0.0 %	100.0 %
SKIING — BIATLON	f	1	3
	f %	25.0 %	75.0 %
SKIING — SNOWBOARDING	f	0	1
	f %	0.0 %	100.0 %
SKIING — SKI JUMPING	f	1	3
	f %	25.0 %	75.0 %
SKIING — SKI JUMPING	f	0	1
	f %	0.0 %	100.0 %
SHOOTING	f	4	4
	f %	50.0 %	50.0 %
TAEKWONDO — WTF	f	2	1
	f %	66.7 %	33.3 %
ROWING	f	0	9
	f %	0.0 %	100.0 %
Total	f	20	54
	f %	27.0 %	73.0 %

Table 4 shows the athletes in different sports, who did or. Respectively. did not achieve the status of a prospective athlete in junior category, and achieved rankings from 1st to 3rd place in the biggest competitions in senior category. Since the dispersion of the results was large and the number of classifications by individual sports relatively low, the interpretation is limited. In the monitored period 2008–2013 women reached by 32 % less top results than men in senior competition level. Given the total number of athletes in senior category, there were 50 % fewer athletes who did not achieve top results in the junior category among men and 48 % fewer among women. The proportion between athletes in senior category who achieved top results at the biggest competitions and the athletes who failed to gain a perspective class in the junior category between men and women is equal, which is 27 % less.

DISCUSSION

We have noted that the Slovenian athletes are, seen through the years and in their absolute achievements, very successful in both of the monitored categories, junior and senior. Depending on the number of inhabitants the result performance of Slovenian athletes at the biggest competitions is above average, when compared to other countries (Bloomberg, 2014; Grujič, 2013; Kolar et al., 2007). Slovenian athletes achieved top

level results in the period 2008–2013 in 23 Olympic Sports, representing 43 % of the total number of Olympic sports.

For better understanding, we would like to highlight the limitations resulting from the research sample and instruments. We opted for athletes who had achieved one of the first three positions in major competitions. Because of this, some top athletes were dropped out. Another limitation is that we followed the results retrospectively rather than longitudinally. The next restriction is related to the follow-up period of the result success (six years). Another limitation is also that we followed up only the Olympic sports.

Despite the limitations, the results and analysis of the results highlight the success of Slovenian athletes in the biggest competitions, while the in-depth analysis unveils the deficiencies of Slovenian professional sport. The data clearly show that the balance in achieving top results for the period 2008–2013 has been disturbed, and between junior and senior category, since there are by 106 % more top level results achieved in junior categories at the biggest competitions than in senior categories. At the same time, the result success identified at the state level appears within the national sports federations as unsystematic, almost at random in junior and senior competition levels. The exception is the Judo Federation of Slovenia, which has a positive trend and systematically achieved superior results over the period 2008–2013, both in junior and in the senior competition level.

Comparison in success performance by gender has shown that Slovenian female athletes have lower dispersion of top results, smaller number of rankings among the top three places at the biggest competitions and a smaller number of individuals that achieve top results in comparison with the Slovenian male athletes.

Good performance in the junior and senior categories is above average, as we have already stated above. By comparing the individual success of each athlete in junior and senior competitions we can ascertain that during the transition from junior to senior competition level many successful athletes slip into average. This phenomenon is negative for the athlete, for his basic organization, i.e., his sports federation, and this fact also reduces the success at the state level.

It is interesting to find out that in the senior competition level the average age of the male athletes is 27 years and the average age of female athletes is 25 years when they achieve excellent results. For this reason, we could not conduct a longitudinal study and monitor the development of the outcome of each junior athlete to senior competition level, as we would have to obtain the results of all juniors for selected matches for a much longer period. This is also one of the weaknesses of this research. For this reason, we monitored the athletes who in the senior competition level achieved a criterion result and retroactively identified their best rankings in the junior category and then compared them with benchmark result (ranking in selected competitions and categorization).

Based on retrospective analysis of data (from senior to junior category), we found out that 49 % of athletes who achieved a ranking from 1st to 3rd place in selected competitions, did not achieve such an outcome in selected competitions in the junior competi-

tion. The same analysis found that 27 % of all those who have reached the rank of 1st to 3rd place in selected competitions, failed to obtain the status of an athlete of prospective class. -In any case, there is an extremely large gap in the athlete's performance in the junior and in the senior competition level, which reveals that it is not necessary that the same athlete is successful in results in the junior competition in order to make a successful appearance in the senior competition.

In addition, junior competition criterion results for the period 2008–2013 were reached by 191 % more athletes than in the senior competition. Based on these data, we estimate that there is a risk that the vast majority of junior athletes (more than 70 %) who achieved a criterion result in the junior category will not be able to repeat it in the senior category.

Comparative analysis among sports regarding the number of holders of the status of prospective class in the junior category for athletes who achieved the rank from 1st to 3rd place in senior category in the biggest competitions, offers interesting findings and highlights the potential shortcomings of categorisation system for certain sports. Due to the limitation of research, which is mainly subject to the lack of longitudinal monitoring of the transition from junior to senior category, we can claim and point out that it would seem necessary to examine the categorization system. In particular, it would be necessary to pay attention to the determination of the status of prospective athlete in view of the facts found in the study.

The Slovenian elite sport has many successful junior athletes and also dropout rate in respect of the performance of the same athletes in the senior competition level. It would be advisable and helpful to explore, in cooperation with national sport federation's experts, the content characteristics of the system that makes this possible, and to contribute in this way to the reduction of the result dropout rates of successful junior athletes later in senior competitions.

Quite a few studies (Arampatzis, Stafilidis, Morey-Klapsing, & Bruggemann, 2004; Bompa, 2001; Bon, 2001; DiFiori, Puffer, Aish, & Dorey, 2002; Frish et al., 2008; Kandare & Tušak, 2010; Kujala et al., 1995; Markolf, Shapiro, Mandelbaum, & Teurlings, 1990; Mlinarec, 2010; Montgomery, 1998; Pettersson & Lorentzon, 1993; Pocecco et al., 2013; Pori, 2003; Reilly, 1990; Sattler, 2010; Ušaj, 2003; Wanivenhaus, Fox, Chaudhury, & Rodeo, 2012) have already pointed out the problems in training young athletes (health care, psychological preparation, management of the athlete's career, etc.), which can be applied also to the findings of our research.

Most of the researchers suggest that coaches do not take into consideration enough the developmental characteristics of young athletes which lead to a saturation and fatigue, and to an increased number of sports injuries due to overloading. The above mentioned authors attributed saturation and fatigue mainly to high intensity and early specialization of athletes. Overload syndromes are also inseparably linked to these factors, resulting in an increased number of chronic and recurrent sports injuries. From this reason, an athlete is not able to train for longer periods and consequently his/her progress slows down or is even limited.

Competent managers are equally important. The study titled “Key competences Slovenian sports managers” (Retar, Plevnik, & Kolar, 2013) emphasises particularly the importance and the role of a competent sports manager whose key objective is to develop a positive working environment, to function as a professional and moral authority and to properly organise and delegate the tasks. Other, also very important skills are the ability to work with people and apply the acquired knowledge in practice and to possess the ability to generate new ideas.

By all means, the findings may provide support in the implementation of strategic objectives that are set out in the National Programme of Sport (the top sports programme), in particular in the maintenance of the number of world-class athletes, and in maintaining the number of medals won at the Olympics, World Championships, European Championships and the final rankings in the World Cups as well as in comprehensive development of top athletes during their sporting career and after it (*Nacionalni program športa v Republiki Sloveniji 2014–2023*, 2014).

Since the addressed problem has not been studied yet, we cannot compare our data to determine whether the observed difference is a deviation or is it a natural phenomenon. We suggest that further in-depth researches follow the trend of transfer from junior to senior category and the trend of achieving the expected top results. The findings given through the analysis of the results and the discussion are not a criticism of Slovenian sport or expert staff. The aim of the research was to identify shortcomings as objectively as possible, in order to initiate relevant measures towards raising the level of sporting success of Slovenian athletes.

CONCLUSIONS

The purpose of this study is to contribute to the development of Slovenian sport with a critical analysis of individual segments. In this paper we define guidelines for managers in Slovenian sport in order to preserve the achieved level and possibly to raise it to a higher level despite the period of global economic, financial and moral – ethical crisis. The study “Social competencies of Slovenian sport managers” (Retar, Pišot, & Kolar, 2014) showed that very important social competences of managers are as follows: “developing a positive working environment”, “presentation of professional and moral authority” and “proper organising and delegating tasks”, which may explain both sports and business performance of sports organizations. Our findings and guidelines for the preservation of result performance in the senior category, for the increase in the number of top athletes, for the systematisation of professional work in individual sports are based also on the improvement of sports managers’ key competencies. Managers do the planning, organising, implementing, providing the funds and supervising of the work of professional team members and a number of other stakeholders without whom there would be no top sports achievements. Therefore, we suggest further in-depth research that will respond to the question who are the key stakeholders and how

to influence them in order to improve the areas of weakness, defined in our study, to a higher level.

REFERENCES

- All-time Youth Olympic Games medal table.** Retrieved October 16th 2014 from: http://en.wikipedia.org/wiki/Youth_Olympic_Games#References.
- Aramatzis, A., Stafilidis, S., Morey-Klapsing, G., & Bruggemann, G. P. (2004).** Interaction of the human body and surfaces of different stiffness during drop jumps. *Medicine & Science in Sports & Exercise*, 36(3), 451–459.
- Bloomberg (2014).** Who's Won the Most Medals in Sochi. Retrieved October 16th 2014 from: <http://www.bloomberg.com/infographics/2014-02-07/sochi-olympics-medals.html>.
- Bompa, T. O. (2001).** Periodizacija: Teorija in metodologija treninga. Zagreb: Hrvatski košarkarski savez.
- Bon, M. (2001).** Kvantificirano vrednotenje obremenitev in spremljanje frekvence srca igralcev rokometa med tekmo. (Doktorska disertacija). Ljubljana: Univerza v Ljubljani, Fakulteta za šport.
- DiFiori, J. P., Puffer, J. C., Aish, B., & Dorey, F. (2002).** Wrist pain, distal radial physeal injury, and ulnar variance in young gymnasts: does a relationship exist? *American Journal of Sports Medicine*, 30(6), 879–885.
- Frish, A., Seil, R., Urhausen, A., Crisier, L., Lair, L., & Theisen, D. (2008).** Analysis of sex-specific injury patterns and risk factors in young high-level athletes. *Scandinavian journal of medicine & science in sport*, 19, 834–841.
- Grujič, S. (2013).** Šport v številkah – Pregled športa v Republiki Sloveniji v obdobju od leta 2009 do 2012. Ljubljana: Zavod za šport RS Planica.
- Jurak, G. & Pavletič, P. S. (Eds.) (2014).** Nacionalni program športa v Republiki Sloveniji 2014–2023. Ljubljana: Zavod za šport RS Planica.
- Kandare, M., & Tušak, M. (2010).** Premagovanje športnih poškodb. Ljubljana: Univerza v Ljubljani, Fakulteta za šport – Inštitut za šport.
- Kolar, E., Bednarik, J., Kovač, M., & Jurak, G. (2007).** Vrednotenje športnega dosežka. *Šport*, 55(2), 34–39.
- Kolar, E., & Kovač, M. (2010).** Analiza športa otrok in mladine, usmerjenih v kakovostni in vrhunski šport. In E. Kolar, G. Jurak, & M. Kovač (Eds.), *Analiza nacionalnega programa športa v Republiki Sloveniji 2000–2010* (pp. 209–222). Ljubljana: Fakulteta za šport. Retrieved June 18th 2014 from: http://www.fsp.uni-lj.si/raziskovanje/znanstvene_monografije/.
- Kolar, E., & Rajšter, M. (2010).** Analiza kakovostnega in vrhunškega športa. In E. Kolar, G. Jurak, & M. Kovač (Eds.), *Analiza nacionalnega programa športa v Republiki Sloveniji 2000–2010* (pp. 223–245). Ljubljana: Fakulteta za šport. Retrieved June 18th 2014 from: http://www.fsp.uni-lj.si/raziskovanje/znanstvene_monografije/.

- Kujala, U., Taimela, S., Antti-Poika, I., Orava, S., Tuiminen, R., & Myllynen, P. (1995).** Acute injuries in soccer, ice hockey, volleyball, basketball, judo, and karate: analysis of national registry data. *British Medical Journal*, 311, 1465–1468.
- Markolf, K. L., Shapiro, M. S., Mandelbaum, B. R., & Teurlings, L. (1990).** Wrist loading patterns during pommel horse exercises. *Journal of Biomechanics*, 23(10), 1001–1011.
- Mlinarec, D. (2010).** Metode bazične priprave hokejista. (Diplomska naloga). Ljubljana: Fakulteta za šport.
- Montgomery, D. L. (1998).** Physiology of ice hockey. *Sports Medicine*, 99–112.
- Olimpijske športne panoge. (2014).** Retrieved October 17th 2014 from: <http://www.olympic.si/sportne-igre/sportne-panoge/olimpijske-sportne-panoge/>
- Pettersson, M., & Lorentzon, R. (1993).** Ice hockey injuries: a 4-year prospective study of a Swedish élite ice hockey team. *British journal of sports medicine*, 251–254.
- Pocecco, E., Ruedl, G., Stankovic, N., Sterkowicz, S., Del Vecchio, F. B., Gutiérrez-García, C., Rousseau, R., Wolf, M., Kopp, M., Miarka, B., Menz, V., Krüsmann, P., Calmet, M., Malliaropoulos, N., & Burtscher, M. (2013).** Injuries in judo: a systematic literature review including suggestions for prevention. *British journal of sports medicine*, 47(18), 1139–1143.
- Pogoji, pravila in kriteriji za registriranje in kategoriziranje športnikov v Republiki Sloveniji (2013).** Retrieved June 30th 2014 from: <http://www.olympic.si/sportna-kariera/registracija-in-kategorizacija/kriteriji/>
- Pori, P. (2003).** Analiza obremenitev in napora krilnih igralcev v rokometu. (Doktorska disertacija). Ljubljana: Univerza v Ljubljani, Fakulteta za šport.
- Reilly, T. (1990).** Physiology of sports. London, New York: E.&F. N. Spon.
- Retar, I., Pišot, S., & Kolar, E. (2014).** Social competences of Slovenian sport managers. Paper presented at the 7th International scientific conference on kinesiology, Zagreb.
- Retar, I., Plevnik, M., & Kolar, E. (2013).** Key competences of Slovenian sport managers. *Annales kinesiologyae*, 4(2), 81–94.
- Sattler, T. (2010).** Notranji dejavniki tveganja športnih poškodb pri odbojki. (Doktorska disertacija). Ljubljana: Univerza v Ljubljani, Fakulteta za šport.
- Seznam kategoriziranih športnikov (2014).** Retrieved October 17th 2014 from: <http://www.olympic.si/sportna-kariera/registracija-in-kategorizacija/aktualni-seznam/>
- Športne igre. (2014).** Retrieved October 17th 2014 from: <http://www.olympic.si/sportne-igre/sportne-igre/>
- Ušaj, A. (2003).** Kratak pregled osnov športnega treniranja. Ljubljana: Fakulteta za šport, Inštitut za šport.
- Wanivenhaus, F., Fox, A., Chaudhury, S., & Rodeo, S. (2012).** Epidemiology of Injuries and Prevention Strategies in Competitive Swimmers. *Sports Health*, 4, 246–251.