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## PERFORMANCE POSSIBILITIES OF THE COMBINED PENTATHLON EVENT AT THE NATIONAL INDOOR ATHLETICS CHAMPIONSHIP

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### Abstract

*Aim.* The aim of this research is to underline the dynamics of the results recorded on sports categories ranging from women junior III to women senior, in pentathlon events, at a national level.

*Materials and methods.* This paper is based on a study based on records gathered from 38 woman athletes practising combined events. This study was performed in February 2013. Their performances at the pentathlon events (60 m hurdles, high jump, 4-kg discus throw, long jump, 800m run) were evaluated by judges with special and advanced equipment and devices, recorded and published on the site of the Romanian Athletics Federation.

*Results.* The results are summarized on age categories, presented in 6 tables and graphically designed. They are analyzed according to their age categories (senior, youth, junior I, junior II and junior III), but also according to the general scores of the competitors and their performances during the five events and they highlight our women athletes' performance possibilities.

*Conclusions.* The conclusions drawn underline the following facts: the number of clubs which train women athletes practising combined events is reduced (20 clubs); the number of participants (38 contestants) is rather small; their age has a wider range for seniors (born between 1986- 1995) and is narrower for juniors III (born between 1998 and 1999); the scores recorded by the competitors at each event present rather great differences, 292 points for seniors, 324 points for youth and junior I and 329 points for juniors II and III. In addition, we noticed that the highest score was recorded at the 60 m hurdles event, which was of 1021 points (seniors), and the lowest one was recorded at 4 kg discus throw event, which was of 507 points (junior III). The hypothesis according to which the final score in the pentathlon is progressive from juniors III to senior was confirmed and is mainly influenced by the closest values recorded at all the five contest events.

*Key words:* pentathlon, possibilities, performances.

### Introduction

The king of the Olympic sports, athletics, includes an exceptional event which can be found both in men's and women's competition. On stadiums and in halls set up with tracks and field sections, combined events offer the most pleasant and exciting display of power, harmony, strength, perseverance, physical and moral beauty. Sports performance is defined as "a bio-psycho-social value achieved in an official

competition, as a result of a capacity multiply determined and assessed, based on some criteria and scales rigorously established" (according to Dragnea, 1999). Great sports competitions, for example competitions specific to national championships, are previously prepared. Combined events, in our case indoor pentathlon, including 60 m hurdles, high jump, discus throw, long jump and 800m run imply on the one hand, training for improving an execution

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technique and on the other hand, developing the level of abilities for psychological training and tactics to approach competition. The pentathlon's result coming from adding the points for the individual performances, for each of the five events, depends on the way and level of training for each of these during practice. The performance capacity at the combined events depends on the one hand on the training process, and on the other hand, on the physical, motor and psychical predispositions. Reaching sports performance "requires a great number of repetitions, avoiding using the same tempi and promoting an analytical method to approach it" (Pradet, 1996 and Duray, 1997), but in the combined events, training is characterized by diversity, variability and complexity. The challenge in the pentathlon competition means physical and psychical strain, extended but variable. The sports result in pentathlon is the product of some great efforts in several events, all characterized by increased indices of speed and rapid strength. "The exploitation of the speed potential depends on the practical-methodological mastery of every specialized teacher" (Ardelean, 1991), therefore, also on the manner in which the technical instruction is performed and how the performance development of the respective technique is approached by increased indices of speed, strength, coordination and endurance. The pentathlon event, comprising five events, is characterized by these indices, but also by "competitive strains which imply high movement and action speeds" (Bauersfeld, 1988) under the pressure of endurance. The sports result in a combined event in athletics "comes from an objective sequence and combination, from reactive changes to stable adjustments" (Solodkov, 1990), but also from the manner of participation within the competition and the individual features of every contestant. For a sportsman, "a high qualification [...] is highlighted by a great stability" (Tschiene, 1988), and in a pentathlon, stability means getting better results at every event.

### Materials and methods

For this research we used several methods, such as: bibliographic study, testing, statistics and graphics. The assessment was based on the results recorded by the women athletes participating in the Indoor National Athletics Championship. The performances at the pentathlon event (60 m hurdles, high jump, 4 kg discus throw, long jump, 800 m run) were measured by judges, with special and advanced equipment and devices, recorded and published on the site of the Romanian Athletics Federation. As *subjects*, we chose a group of 38 women athletes, participating at the Indoor National Athletics Championship – Combined events which took place in Bucharest during February 17th-18th, 2013. The evaluation of the competition dynamics was made based on the analysis of the individual results (sports performances and scores) which the women athletes received at all five competition events (60 m hurdles, high jump, 4 kg discus throw, long jump, 800 m run) during the two rounds of the competition. The hypothesis, which aims to explain and present certain aspects, starts from the supposition that the final score in pentathlon events is progressive from juniors III to seniors and is mainly determined by the closest values recorded at all five competition events.

### Results

The data gathered at National Championship – Combined event for S,T,J1,J2 and J3, which took place in a hall from the "Lia Manoliu" Sports Complex, during February 17th-18th, 2013, were listed and can be found in the following 6 tables (table no. 1, 2, 3, 4 5 and 6). We can observe the range from the youngest women participants (Juniors III) to the eldest (Seniors).

### 1. Analysis of results for women seniors

Table no. 1 – Results for women seniors' group

Crt. no	I.	Club	YoB.	Events												Total points
				60m hurdles			High jump		Discus throw		Long jump		800 m run			
				R (s)	Mov. Speed (m/s)	P	R (m)	P	R (m)	P	R (m)	P	R	Mov. Speed (m/s)	P	
1	P. B	CSU Cluj, CSA Steaua	86	8.48	7.07	1021	1.81	991	13.51	761	6.14	893	147.16	5.43	729	4395
2	P.E	LNPA Căm.-L M. CSM Onești	95	9.08	6.60	893	1.72	879	10.60	569	5.64	741	147.73	5.42	722	3804
3	N. J	CSA Steaua	89	8.95	6.70	920	1.63	771	11.68	640	5.72	765	149.06	5.36	705	3801
4	L. G	LPS Cluj	95	9.63	6.23	783	1.72	879	11.04	598	5.35	657	153.53	5.21	649	3566
5	Z. G	CS Rapid	88	9.53	6.29	802	1.78	953	8.64	441	5.20	614	168.07	4.75	484	3294
6	B. S	AA. C. Iacris Buc	95	9.47	6.47	854	1.45	566	7.76	384	5.23	623	148.60	5.38	711	3138
7	C. T	LNPA Campu L.	94	9.70	6.18	769	1.48	599	9.56	501	4.83	514	162.51	4.92	544	2927



M																
8	L. A	LPS Cluj	93	10.29	5.83	659	1.45	566	8.67	443	5.06	576	152.89	5.23	657	2901
9	P. M	Col. Naț. Onic. Sud 190 Buc.	95	10.03	5.98	706	1.51	632	9.36	488	4.48	423	158.67	5.04	588	2837
10	M. V	LPS Cluj	95	10.06	5.96	701	1.42	534	8.68	443	4.42	408	164.85	4.85	519	2605
11	J. DI	LNPA Cl. Mus.	95	9.84	6.09	742	1.42	534	8.89	457	4.74	490	179.54	4.46	369	2592
12	V. A	CSM Sibiu	93	9.63	6.23	783	1.48	599	8.29	418	5.19	612	0	0	0	2412
X = arithmetic mean				9.55	6.30	802.75	1.55	708.5	9.72	511.91	5.16	609.66	157.51	4.67	607	3189.33
S = standard deviation				0.51	0.35	103.63	0.15	173.99	1.67	109.77	0.51	142.77	10.33	0.32	116.89	598.46
V. max = maximum value				8.48	7.07	1021	1.81	991	13.51	761	6.14	893	147.16	5.43	729	4395
V. min = minimum value				10.29	5.83	659	1.42	534	7.76	384	4.42	408	179.54	4.46	369	2412

\*Legend: I= subjects' initials, YoB. = year of birth, R= result, S. mov. m/s= movement speed in metres per second, P= points X = arithmetic mean, S = standard deviation, V. max = maximum value, V. min = minimum value and CV = coefficient of variability.

In the competition for medals at the women senior category (table no 1), 12 women athletes participated, coming from 8 different sports clubs and born between 1986-1995, athletes who reached total scores between 2412 and 4395 points. Out of the 12 women athletes, the last one missed the 800m run event, which made us take into account the results of the rest 11 women athletes.

The results recorded and presented in the table no. 1 underline the following aspects:

- at the 60m speed hurdles, the recorded timing has an average value of 9.55 s, with extreme values of 10.29 and 8.48 seconds, the movement speed recorded a mean of 6.30 m/s with extreme values of 7.07 and 5.83 m/s, and the corresponding score has an

average value of 802.75 points with extreme values of 659 and 1021 points;

- at the high jump event, the height of the jump has an average mean of 1.55m, with extreme values of 1.42m and 1.81m, and the corresponding score has an average value of 708.5 points with extreme values of 534 and 991 points;

- at the 4kg discus throw, the length of the throw has an average value of 9.72m, with extreme values of 7.66m and 13.51 m, and the corresponding score has an average value of 511.91 points with extreme values of 384 and 761 points;

- at the long jump event, the length of the jump has an average value of 5.16m, with extreme values of 4.42m and 6.14m, and the corresponding score has an average value of 609.66 points with extreme values of 408 and 893 points;

- at the 800m endurance run, the recorded timing has an average value of 157.51 s, with extreme values of 179.54 and 147.16 seconds, the movement speed recorded a mean of 4.67m/s with extreme values of 4.46 and 5.43m/s, and the corresponding score has an average value of 607 points with extreme values of 368 and 729 points.

## 2. Analysis of results for girls youth

Table no. 2 – Results for the group of girls youth

Crt. No.	I.	Club	YoB	Events												Total points
				60m hurdles			High jump		Discus throw		Long jump		800 m run			
				R (s)	Mov. Speed (m/s)	P	R (m)	P	R (m)	P	R (m)	P	R	Mov. Speed (m/s)	P	
1	P. E	LNPA Câmpu L M, CSM Onești	95	9.08	6.60	893	1.72	879	10.60	569	5.64	741	147.73	5.42	722	3804
2	L.G	LPS Cluj	95	9.63	6.23	783	1.72	879	11.04	598	5.35	657	153.53	5.21	649	3566
3	B. S	AA. C. Iacris Buc	95	9.27	6.47	854	1.45	566	7.76	384	5.23	623	148.60	5.38	711	
4	C. T	LNPA Câmpu L M	94	9.70	6.18	769	1.48	599	9.56	501	4.83	514	162.51	4.92	544	2927
5	L. A	LPS Cluj	93	10.29	5.83	659	1.45	566	8.67	443	5.06	576	152.89	5.23	657	2901
6	P. M	Col. Naț. O. Onic. Sud 190 Buc.	95	10.03	5.98	706	1.51	632	9.36	488	4.48	423	158.67	5.04	588	2837
7	M V	LPS Cluj	95	10.06	5.96	701	1.42	534	8.68	443	4.42	408	164.85	4.85	519	2605
8	J DI	LNPA Cl. Muscel	95	9.84	6.09	742	1.42	534	8.89	457	4.74	490	179.54	4.46	369	2592
9	V A	CSM Sibiu	93	9.63	6.23	783	1.48	599	8.29	418	5.19	612	0	0	0	2412
X = arithmetic mean				9.73	6.17	765.56	1.49	643.11	9.21	477.89	4.99	560.44	158.54	5.06	594.88	2955.50
S = standard deviation				0.38	0.25	74.42	0.10	137.39	1.06	69.50	0.41	110.67	10.48	0.32	117.01	487.10
V. max = maximum value				9.08	6.60	893	1.72	879	11.04	598	5.64	741	147.73	5.42	722	3804
V. min = minimum value				10.29	5.83	659	1.42	534	7.76	384	4.42	408	179.54	4.46	369	2412

In the competition for medals at the girls youth category (table no 2), 9 athletes participated, coming from 6 different sports clubs and born between 1995-1993, athletes who reached total scores between 2412 and 4395 points. Out of the 9 women athletes, one missed the 800m run event.

The results recorded underline the following aspects:

- at the 60m speed hurdles, the recorded timing has an average value of 9.73s, with extreme values of 10.29 and 9.08 seconds, the movement speed recorded a mean of 6.17 m/s with extreme values of 5.83 and 6.60 m/s, and the corresponding score has an average value of 765.56 points with extreme values of 659 and 893 points;

- at the high jump event, the height of the jump has an average mean of 1.49 m, with extreme values of 1.42m and 1.72 m, and the corresponding score has an average value of 708.5 points with extreme values of 534 and 879 points;

- at the 4kg discus throw, the length of the throw has an average value of 9.21 m, with extreme values of 7.76 m and 11.04 m, and the corresponding score has an average value of 477.89 points with extreme values of 384 and 598 points;

- at the long jump event, the length of the jump has an average value of 4.99 m, with extreme values of 4.42m and 5.64 m, and the corresponding score has an average value of 560.5 points with extreme values of 408 and 741 points;

- at the 800m endurance run, the recorded timing has an average value of 158.54 s, with extreme values of 179.54 and 147.73 seconds, the movement speed recorded a mean of 5.06 m/s with extreme values of 4.46 and 5.42m/s, and the corresponding score has an average value of 594.88 points with extreme values of 369 and 722 points.

In the competition for medals at women juniors I (table no 3), 9 athletes participated, coming from 7 different sports clubs and born between 1995- 1993, athletes who reached total scores between 2592 and 3804 points. Out of the 9 women athletes, only one is her second year of activity and two were not included in the youth and senior competition.

The results recorded underline the following aspects:

- at the 60m speed hurdles, the recorded timing has an average value of 9.65 s, with extreme values of 10.29 and 9.08 seconds, the movement speed recorded a mean of 6.22 m/s with extreme values of 5.96 and 6.60 m/s, and the corresponding score has an average value of 780.11 points with extreme values of 701 and 893 points;

- at the high jump event, the height of the jump has an average mean of 1.52 m, with extreme values of 1.42m and 1.72 m, and the corresponding score has an average value of 669.56 points with extreme values of 534 and 879 points;

- at the 4kg discus throw, the length of the throw has an average value of 9.36 m, with extreme values of 7.76 m and 11.04 m, and the corresponding score has an average value of 488 points with extreme values of 384 and 598 points;

- at the long jump event, the length of the jump has an average value of 5.01 m, with extreme values of 4.42m and 5.64 m, and the corresponding score has an average value of 566.22 points with extreme values of 408 and 741 points;

- at the 800m endurance run, the recorded timing has an average value of 159.22 s, with extreme values of 179.54 and 147.73 seconds, the movement speed recorded a mean of 5.15 m/s with extreme values of 4.85 and 5.45m/s, and the corresponding score has an average value of 586.11 points with extreme values of 369 and 722 points.

### 3. Analysis of results for women juniors I

Table no. 3 – Results for the group of women juniors I

Rt. no.	I.	Club	YoB	Events												Total points
				60m hurdles			High jump		Discus throw		Long jump		800 m run			
				R (s)	Mov. Speed (m/s)	P	R (m)	P	R (m)	P	R (m)	P	R	Mov. Speed (m/s)	P	
1	P. EA	LNPA Câmpu L M., CSM Onești	95	9.08	6.60	893	1.72	879	10.60	569	5.64	741	147.73	5.41	722	3804
2	L G	LPS Cluj	95	9.63	6.23	783	1.72	879	11.04	598	5.35	657	153.53	5.21	649	3566
3	AAR	CSM Focșani	95	9.56	6.27	796	1.63	771	8.56	436	5.16	603	159.54	5.01	578	3184
4	BFI	CSS 5 Bucuresti	95	9.66	6.21	777	1.51	632	9.80	516	5.28	637	158.05	5.06	595	3157
5	B SE	AA C. Iacris Buc	95	9.27	6.47	854	1.45	566	7.76	384	5.23	623	148.60	5.38	711	3138
6	C TF	LNPA Cl. M	94	9.70	6.18	769	1.48	599	9.56	501	4.83	514	162.51	4.93	544	2927
7	PMD	Col.Naț.O.Onic. Sud 190 Buc.	95	10.03	5.98	706	1.51	632	9.36	488	4.48	423	158.67	5.04	588	2837
8	M V	LPS Cluj	95	10.06	5.96	701	1.42	534	8.68	443	4.42	408	164.85	4.85	519	2605
9	J DI	LNPA Cl. M	95	9.84	6.09	742	1.42	534	8.89	457	4.74	490	179.54	5.45	369	2592
X = arithmetic mean				9.65	6.22	780.11	1.52	669.56	9.36	488	5.01	566.22	159.22	5.15	586.11	3090



S = standard deviation	0.32	0.22	63.05	0.11	138.43	1.03	67.19	0.42	113.17	9.58	0.22	106.99	407.09
V. max = maximum value	10.06	6.60	893	1.72	879	11.04	598	5.64	741	179.54	5.45	722	3804
V. min = minimum value	9.08	5.96	701	1.42	534	7.76	384	4.42	408	147.73	4.85	369	2592

#### 4. Analysis of results for women junior II

Table no. 4 – Results for the group of women juniors II

Crt. No.	I.	Club	YoB	Events												Total points	
				60m hurdles			High jump		Discus throw		Long jump		800 m run				
				R	Mov.	P	R	P	R	P	R	P	R	Mov.	P		
				(s)	Speed (m/s)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m/s)		
1	AGI	SCM Bacau	99	9.36	6.41	836	1.52	644	9.66	507	5.52	706	154.86	5.16	633	3326	
2	B A	SCM Bacau	96	9.58	6.26	792	1.70	855	8.18	411	5.05	573	152.32	5.25	664	3295	
3	D C	LPS Cluj	97	9.39	6.38	830	1.58	712	8.62	440	5.23	623	151.32	5.28	576	3281	
4	TAM	CSS Olimpia Buc	97	9.73	6.16	763	1.61	747	10.84	585	5.11	589	160.18	4.99	571	3255	
5	ALA	LPS Cluj	97	9.64	6.22	781	1.52	644	8.78	450	4.90	532	142.92	5.59	784	3191	
6	ORG	CSM Sibiu	97	9.63	6.23	783	1.49	610	9.82	518	5.32	648	169.40	4.72	473	3032	
7	VES	AA. C. Iacris Buc	96	9.27	6.47	854	1.42	512	8.70	451	4.99	557	160.04	4.99	572	2946	
8	PDC	CSS Lugoj	98	9.49	6.32	810	1.40	512	8.28	417	5.34	654	172.37	4.64	439	2832	
9	AAI	CSS Pandurii Tg. Jiu	99	10.30	5.82	657	1.55	678	7.20	348	4.88	525	162.05	4.93	550	2760	
10	BAM	CSS Șoimii Sibiu	97	10.08	5.95	697	1.58	712	7.79	386	4.60	454	168.74	4.75	477	2726	
11	RDM	AA C. Iacris Buc	97	9.76	6.14	758	1.58	712	7.07	340	4.68	474	175.94	4.54	404	2688	
12	T A	CSS Bacau	98	10.60	5.66	604	1.58	712	6.36	294	4.86	522	161.79	4.94	553	2685	
13	T V	CSM Focșani	96	10.46	5.73	629	1.37	481	10.04	532	4.82	511	180.52	4.43	251	2513	
14	PDA	LPS P.T. Craiova	99	10.16	5.90	682	1.40	512	6.99	334	4.64	464	173.07	4.62	432	2424	
15	AAM	LPS Roman	98	10.24	5.85	668	1.49	610	6.52	304	4.26	369	173.12	5.62	432	2383	
16	DAE	CSS 7 Dinamo Buc.	99	9.83	6.10	744	1.34	449	6.83	324	4.72	485	193	4.14	254	2256	
17	MNM	LPS Cuj Napoca	98	10.83	5.54	565	1.22	331	7.27	352	4.15	343	160.33	4.98	569	2160	
18	SAM	LPS Roman	99	12.32	4.87	340	1.37	481	6.21	285	4.46	418	178.71	4.47	377	1901	
				X = arithmetic mean	10.04	6.00	710.72	1.48	606.33	8.06	404.33	4.86	524.83	166.15	4.89	500.61	2758.56
				S = standard deviation	0.73	0.39	125.00	0.12	131.27	1.38	89.58	0.37	98.12	12.26	0.40	135.56	427.20
				V. max = maximum value	12.32	6.47	854	1.70	855	10.84	585	5.52	706	193	5.62	784	3326
				V. min = minimum value	9.27	4.87	340	1.22	331	6.21	285	4.15	343	142.92	4.14	251	1901

In the competition for medals at women juniors II (table no 4), 21 athletes participated, coming from 10 different sports clubs and born between 1996- 1999, athletes who reached total scores between 1901 and 3326 points. Out of the 21 women athletes, three were disqualified or abandoned one or two events during the competition.

The results recorded underline the following aspects:

- at the 60m speed hurdles, the recorded timing has an average value of 10.04 s, with extreme values of 12.32 and 9.27 seconds, the movement speed recorded a mean of 6.00 m/s with extreme values of 4.87 and 6.47 m/s, and the corresponding score has an average value of 710.72 points with extreme values of 340 and 854 points;

- at the high jump event, the height of the jump has an average mean of 1.48m, with extreme values of

1.22m and 1.70 m, and the corresponding score has an average value of 606.33 points with extreme values of 331 and 855 points;

- at the 4kg discus throw, the length of the throw has an average value of 8.06 m, with extreme values of 6.21 m and 10.84 m, and the corresponding score has an average value of 404.33 points with extreme values of 285 and 585 points;

- at the long jump event, the length of the jump has an average value of 4.86 m, with extreme values of 4.15 m and 5.52 m, and the corresponding score has an average value of 524.83 points with extreme values of 343 and 706 points;

- at the 800m endurance run, the recorded timing has an average value of 8.06 m, with extreme values of 193 and 147.92 seconds, the movement speed recorded a mean of 4.89 m/s with extreme values of 4.14 and 5.62 m/s, and the corresponding score has an average value of 500.61 points with extreme values of 251 and 784 points.

#### 5. Analysis of results for women juniors III

Table no. 5 – Results for the group of women juniors III

Crt. No.	I.	Club	Y.o.b.	Events												Total points
				60m hurdles			High jump		Discus throw		Long jump		800 m run			
				R	Mov.	P	R	P	R	P	R	P	R	Mov.	P	



			(s)	Speed (m/s)	(m)	(m)	(m)	Speed (m/s)								
1	AGI	SCM Bacau	99	9.36	6.41	836	1.52	644	9.66	507	5.52	706	154.86	5.16	633	3326
2	P D C	CSS Lugoj	98	9.49	6.32	810	1.40	512	8.28	417	5.34	654	172.37	4.64	439	2832
3	A A I	CSS Pandurii Tg. Jiu	99	10.30	5.82	657	1.55	678	7.20	348	4.88	525	162.05	4.93	550	2760
4	T A	CSS Bacau	98	10.60	5.66	604	1.58	712	6.36	294	4.86	522	161.79	4.94	553	2685
5	P D A	LPS P.T. Craiova	99	10.16	5.90	682	1.40	512	6.99	334	4.64	464	173.07	4.62	432	2424
6	A A M	LPS Roman	98	10.24	5.85	668	1.49	610	6.52	304	4.26	369	173.12	5.62	432	2383
7	D AE	CSS7 Dinamo Buc.	99	9.83	6.10	744	1.34	449	6.83	324	4.72	485	193.00	4.14	254	2256
8	MNM	LPS Cuj Napoca	98	10.83	5.54	565	1.22	331	7.27	352	4.15	343	160.33	4.98	569	2160
9	SAM	LPS Roman	99	12.32	4.87	340	1.37	481	6.21	285	4.46	418	178.71	4.47	377	1901
X = arithmetic mean				10.35	5.83	656.22	1.42	547.67	7.26	351.67	4.76	498.44	169.92	4.83	471.00	2525.22
S = standard deviation				0.88	0.46	148.12	0.12	122.90	1.09	70.29	0.46	121.09	11.63	0.43	116.62	424.56
V. max = maximum value				12.32	6.41	836	1.58	712	9.66	507	5.52	706	193	5.62	633	3326
V. min = minimum value				9.36	4.87	340	1.22	331	6.21	285	4.15	343	154.86	4.14	254	1901

In the competition for medals at women juniors III (table no 5), 11 athletes participated, coming from 7 different sports clubs and born between 1998- 1999, athletes who reached total scores between 1901 and 3326 points. Out of the 11 women athletes, two were disqualified at every event.

The results recorded underline the following aspects:

- at the 60m speed hurdles, the recorded timing has an average value of 10.35s, with extreme values of 12.32 and 9.36 seconds, the movement speed recorded a mean of 5.83 m/s with extreme values of 4.87 and 6.41 m/s, and the corresponding score has an average value of 656.22 points with extreme values of 340 and 836 points;

### Discussions

Table no. 6 – Results of the 1st-place winners (women seniors, youth, juniors I, juniors II, juniors III)

Crt. No.	I.	Category	Y.o.B.	60m hurdles			High jump		Events Discus throw		Long jump		800 m run			Total points
				R (s)	Mov. Speed (m/s)	P	R (m)	P	R (m)	P	R (m)	P	R	Mov. Speed (m/s)	P	
1	P. B	Women seniors	86	8.48	7.07	1021	1.81	991	13.51	761	6.14	893	147.16	5.43	729	4395
2	P. E	Women youth	95	9.08	6.60	893	1.72	879	10.60	569	5.64	741	147.73	5.42	722	3804
3	P. EA	Women Juniors I	95	9.08	6.60	893	1.72	879	10.60	569	5.64	741	147.73	5.41	722	3804
4	AGI	Women Juniors II	99	9.36	6.41	836	1.52	644	9.66	507	5.52	706	154.86	5.16	633	3326
5	AGI	Women Juniors III	99	9.36	6.41	836	1.52	644	9.66	507	5.52	706	154.86	5.16	633	3326

As it can be observed in table no. 6, in which the results of the five winners are presented, their age ranges from 27 to 14 years old. The champion title at youth was won by a junior I, and the title at juniors II

- at the high jump event, the height of the jump has an average mean of 1.42m, with extreme values of 1.22m and 1.58 m, and the corresponding score has an average value of 547.67 points with extreme values of 331 and 712 points;

- at the 4kg discus throw, the length of the throw has an average value of 7.27 m, with extreme values of 6.21 m and 9.66 m, and the corresponding score has an average value of 351.67 points with extreme values of 285 and 507 points;

- at the long jump event, the length of the jump has an average value of 4.76 m, with extreme values of 4.15 m and 5.52 m, and the corresponding score has an average value of 498.44 points with extreme values of 343 and 706 points;

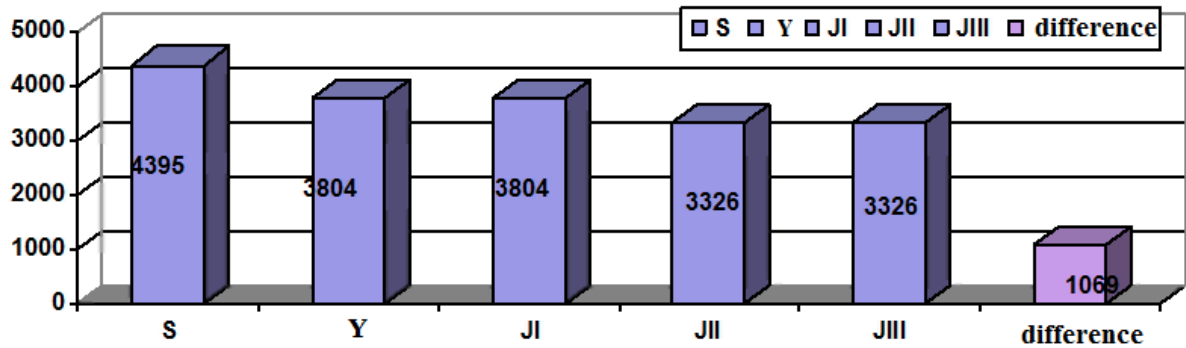
- at the 800m endurance run, the recorded timing has an average value of 169.92 s, with extreme values of 193 and 154.86 seconds, the movement speed recorded a mean of 4.3 m/s with extreme values of 4.14 and 5.62 m/s, and the corresponding score has an average value of 471 points with extreme values of 254 and 633 points.

was won by a junior III, this aspect underlining the lack of valuable sportswomen at youth category and at the level of juniors II, but also a low level of performance.

The results of the final scores which the winners got show a difference of 1069 points between women

juniors III and seniors (graphic no 1), a normal aspect taking into account the age difference.

Graphic no 1- Winners' scores at the pentathlon (women seniors, youth, junior I, II and III)



The winners' scores at all the five events are between 1021 points at 60 m hurdles and 507 points at discus throw.

The highest scores were reached at 60m hurdles and they were 1021 points for women seniors, 893 points for youth and juniors I and 836 points for juniors II and III, and the lowest were recorded at the 4kg discus throw and they were 761 points for women seniors, 569 points for youth and juniors I and 507 points for juniors II and III. At 800m run, we can also observe low scores of 729 points for seniors, 722 points for youth and juniors I and 633 points for juniors II and III. The scores which are between the high and low values were recorded at the high jump event and they were 991 points, 879 points for youth and juniors I and 644 points for juniors II and III, but also at the long jump event and they were 893 points for seniors, 741 points for youth and juniors I and 706 points for juniors II and III. The scores on events reveal very high differences among them, of 292 points for seniors, 324 puncte for youth and seniors and 329 points for juniors II and III.

### Conclusions

Performing this study allowed us to present a series of aspects regarding the results of the women athletes practising combined events in a pentathlon for the indoor competition season.

The analysis and discussion of the results offer us the possibility to draw the following conclusions:

1. the number of clubs which train athletes practising combined events is reduced (20 clubs);
2. the total number of participants was low, reaching 38 participants out of which 34 managed to receive points at every event;
3. the competitors' age has a wider range for women seniors (born between 1986-

1995) and is narrower for women juniors III (născute în 1998 și în 1999);

4. the number of participants is higher for women juniors II (21 competitors) and lower for youth (9 competitors);
5. the scores recorded by the competitors at every event have rather high differences among them, namely 292 points for seniors, 324 points for youth and juniors I and 329 points for juniors II and III;
6. the highest score was recorded at the 60m hurdles event and it was 1021 points (seniors) and the lowest was recorded at the 4kg discus throw event and it reached 507 points (juniors III).
7. the hypothesis according to which the final score of pentathlon events is progressive from women juniors III to seniors was confirmed;
8. the hypothesis according to which reaching a higher score is influenced by the closest values recorded at the five events is also confirmed.

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