ASSESSMENT OF PHYSICAL FITNESS OF FOOTBALL JUDGES OF THE 4TH LUBLIN LEAGUE IN THE SEASON 2016/2017

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- physical fitness
- football judge

Abstract:
The aim of this study was to evaluate and compare the physical fitness between IV football leagues in the season 2016/2017. The group of the respondents was 21 football judges of the 4th Lublin league in the age range of 23 to 35 years. The judges performed a fitness test consisting of two tests: speed test and strength test. The results were analyzed and presented in graphs and tables. The results of the research can contribute to the creation of more effective motor training plans for football referees. They will also be a valuable resource for those involved in developing training plans for arbitrators at both lower and higher levels of play.

INTRODUCTION

Football is considered by many professionals to be one of the most popular sports in the world. The media play the big role they create future idol players of the young generation. Football players also participate in many advertising campaigns, which shoots additionally the football market. Fans, activists, and sponsors require athletic performance from athletes, which translates into a continuous development of motor skills. Matches are progressing at an accelerated rate, and the players are running higher distances during the match, at higher levels of intensity (Weston i wsp. 2012, Mazaheri i wsp. 2016).

Football refereeing starts at about 16 and ends depending on the physical ability of the individual and the licenses for the age of about 45 years. By the age of 25, the body's capacity begins to slowly deteriorate. Statistically the highest level of judging is between 30 and 45 years old. Research also shows that younger arbitrators are better at performing fitness tests than their older colleagues. However, on the basis of the data it can be said that the experience plays a bigger role, since in the largest events, arbitration takes place after the age of 30. Knowing all these relationships can be a more effective way to program training (Castagna i wsp. 2005, Casajus, Castagna 2007, Galanti i wsp. 2008, PZPN 2011).

Football is an acyclic sport and is characterized by anaerobic and aerobic exercise. The athlete's efforts are in most cases short-lived with a high degree of intensity, interspersed with efforts at moderate and low levels. Research shows that the players during the game run at the highest level of the game from 10 to 12km. An important role in modern football, more and more often used are offensive tactics of the game, which causes the players to use the game of counterattack or pressing. These situations require the judges to prepare the motor performance at the highest possible level (Castagna, D'Ottavio 2001, Weston i wsp. 2011).

Both principal and lateral arbitrators must move accordingly during the match in order to comply with the rules. Therefore, they must be efficient not only mentally but also technically and physically (Andryszak 2003, Fudala 2005).

Studies show that the judges participating in the ME, World Championships, CL or best world leagues run on average between 9 and 13km per game. The heart rate is most of the

time at 85 - 90% HRmax and 70 - 80% Vo₂max (maximum oxygen uptake) (Castagna i wsp. 2007, Yanci i wsp. 2016).

In order to compare the ability of the judges against the background of FA Premier League players, a comparative study was conducted. It has been shown that despite the age, which often in the case of judges is 10-15 years more, there are no significant differences in the results in motor preparation between the two groups (Weston i wsp. 2011, Weston i wsp. 2010).

Proper movement during the match by the referee, translates into a larger field of view during the match, and consequently correct decisions, such as during a foul, play with the hand or enforce a penalty. The ability to move in line when determining the position burned in the case of a linear judge is important. Judges must therefore also be trained with the proper mechanics of movement during the match so that their movements are ergonomic (Ghasemi i wsp. 2009), (Mallo i wsp. 2012).

Walking more than 10km with a high pace, as well as variations in movement or dynamic catches, exposes the injured judges. Arbitrators during and outside of the season must prepare for cycling tests in order to check their availability. The studies show that, for 1000 hours of work-related work, there is an average of 4.6 to 19.6 injuries. Statistical data show that injuries are most commonly associated with injuries to tendons and muscles. The area in which the most common injuries occur are the lower limbs, and the hips or groin. Therefore, proper fitness preparation is to counteract this phenomenon (Wong, Hong 2005, Kordi i wsp. 2013).

Nowadays, more and more specialists pay attention to the creation of prevention programs during the training aimed at football judges. Research shows that more than 60% of those in their careers were afflicted with injuries with musculoskeletal system. Research also shows that the most common injuries during a career were during training. On this basis it can be stated that it is necessary to put more emphasis on monitoring the training process of football judges (Bizzini i wsp. 2009a Bizzini i wsp. 2009b, Gacek 2016).

In conclusion, it can be stated that the preparation of a judge who can perform his profession at the highest level even after the age of 40 is necessary. Properly personalized and scheduled training programs should be used by each arbitrator not only to enhance his or her sports level, but also to prevent injury. This action can lead to the later retirement of this professional group.

OBJECTIVES, RESEARCH MATERIALS AND METHODS

The aim of this study was to evaluate and compare the physical fitness between IV football leagues in the season 2016/2017. The group of the respondents was 21 football judges of the 4th Lublin league in the age range of 23 to 35 years. The site of the research was a playground at the 16th Junior High School in Lublin. The fitness test was conducted in four dates in September and October 2016 and in March and May 2017. In two dates in 2016, 21 people participated in the study, while 19 were in 2017. The results obtained were collected during the speed tests and strength tests of football judges of the 4th Lublin league.

The conditioning test consisted of two parts:
1. Speed test:
   - 6 runs at a distance of 40 m as measured by a photocell. (minimum credit was 6,2 sec.)
2. Endurance test:
   - 40 runs at 75 m in 15 seconds and 25 m in 20 seconds - intervals. This distance corresponds to 4,000 m or 10 laps of the 400-meter raceway (obtaining this result does not entitle the judge to apply for promotion).

- 48 runs x 75 m in 15 seconds and 25 m in 20 seconds – intervals. This distance corresponds to 4,800 m or 12 laps of the 400-meter raceway (obtaining this result does not entitle the judge to apply for promotion).

The table is used for speed estimation

Table 1. Standards and evaluation of speed test

Norms	<5,6	5,6-5,7	5,8-5,9	6,0-6,1
Evaluation	excellent	Very good	good	Requires more practice

RESULTS

Table 2. Results of the short run of day 7.09.2016r.

LP	*Lublin* INITIALS	SHORT RUNS 1st RUN	2nd RUN	3rd RUN	4th RUN	5th RUN	6th RUN
1	B.J.	5,20	5,11	5,17	5,19	5,22	5,26
2	C.K.	5,29	5,22	5,39	5,30	5,31	5,37
3	K.B.	5,56	5,48	5,55	5,59	5,56	5,66
4	K.Pa.	5,75	5,89	6,02	5,96	5,85	6,01
5	K.Pi.	5,59	5,47	5,65	5,53	5,51	5,90
6	K.M.	5,70	5,71	5,78	5,78	5,79	5,89
7	K.T.	6,13	5,70	5,80	5,83	5,76	6,06
8	K.Ma.	5,58	5,53	5,64	5,69	5,63	5,74
9	K.P.	5,91	5,88	5,90	5,92	5,94	5,95
10	K.D.	5,31	5,31	5,43	5,47	5,47	5,51
11	K.M.	5,67	5,68	5,71	5,70	5,77	5,51
12	P.J.	5,55	5,47	5,48	5,55	5,42	5,70
13	R.W.	6,04	5,97	6,06	6,06	6,13	6,11
14	R.R.	5,78	5,76	5,80	5,78	5,72	5,73
15	S.P.	5,65	5,54	5,56	5,49	5,53	5,50
16	S.Ł.	5,28	5,34	5,34	5,23	5,41	5,51
17	T.P.	5,80	5,65	5,67	5,62	5,66	5,63
18	W.K.	5,62	5,60	5,59	5,64	5,65	5,63
19	W.M.	5,10	5,23	5,24	5,33	5,22	5,22
20	W.Ł.	5,64	5,64	6,06	5,74	5,74	5,79
21	W.P.	5,37	5,51	5,43	5,49	5,64	5,51
	x	5,60	5,56	5,63	5,61	5,62	5,68
	SD	0,27	0,23	0,26	0,24	0,23	0,25

source: Tests of football judges organized by the College of Judges
Lublin Football Association.

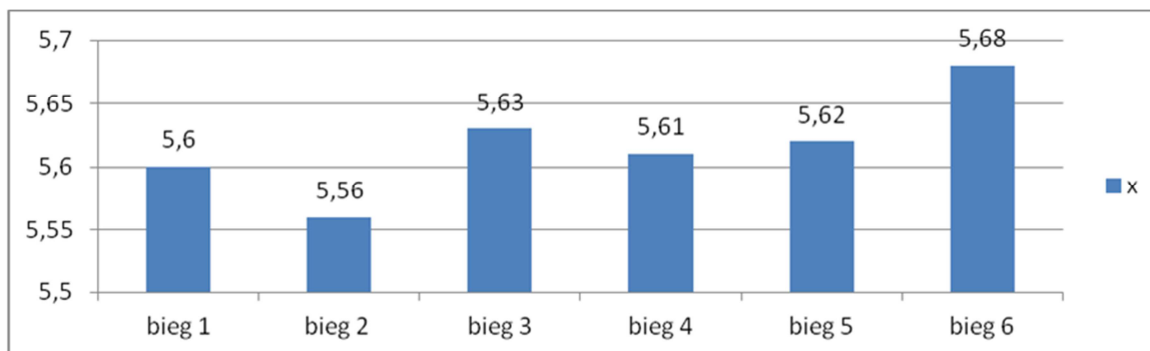**Fig. 2**. Average results from short runs of the day 7.09.2016r.

Average running time of 1st run was set 5,60 s ± 0,27. The difference between the best and the worst result was 1,03s. In the case of 2nd run the average result of all the participants was 5,56 s ± 0,23. The difference between the best and the worst result was 0,86s. Average running time of 3rd run was set 5,63 s ± 0,27. The difference between the best and the worst result was 0,89s. In the case of 4th run the average result of all the participants was 5,61 s ±0,24. The difference between the best and the worst result was 0,87s. Average running time of 5th run was set 5,62 s ±0,23. The difference between the best and the worst result was 0,91s. In the case of 6th run the average result of all the participants was 5,68 s ± 0,25. The difference between the best and the worst result was 0,85s (tab.2, fig.2).

Table 3. Results of the short run of day 18.10.2016r.

	Lublin	**SHORT RUNS**					
LP	**INITIALS**	**1st RUN**	**2nd RUN**	**3rd RUN**	**4th RUN**	**5th RUN**	**6th RUN**
1	B.J.	5,28	5,15	5,2	5,22	5,23	5,22
2	G.M.	5,9	5,95	5,93	5,89	5,94	6,08
3	K.B.	5,6	5,63	5,47	5,6	5,7	5,8
4	K.Pa.	6,2	5,82	5,85	5,9	5,91	5,94
5	K.Pi.	5,63	5,41	5,46	5,49	5,57	5,48
6	K.Ma.	5,93	5,77	5,76	5,76	5,87	5,85
7	K.T.	5,08	5,4	5,41	5,4	5,29	5,15
8	K.M.	5,57	5,54	5,55	5,35	5,46	5,52
9	K.P.	6,07	5,89	5,85	5,76	5,9	5,86
10	K.D.	5,53	5,5	5,42	5,41	5,59	5,48
11	K.M.	5,56	5,51	5,38	5,65	5,55	5,73
12	P.J.	5,52	5,51	5,4	5,45	5,45	5,45
13	R.W.	6,1	5,83	5,73	5,87	5,81	5,02
14	R.R.	5,97	5,74	5,7	5,76	5,64	5,82
15	S.P.	5,31	5,44	5,39	5,47	5,33	5,36
16	S.Ł.	5,78	5,42	5,29	5,37	5,53	5,41
17	T.P.	5,85	5,69	5,76	5,66	5,47	5,49
18	W.K.	5,47	5,69	5,6	5,57	5,58	5,49
19	W.M.	5,03	5,02	5,11	4,96	4,96	5,07
20	W.Ł.	5,59	5,5	5,66	5,63	5,65	5,6
21	W.P.	5,34	5,22	5,25	5,37	5,19	5,6
	x	5,63	5,55	5,53	5,55	5,55	5,54
	SD	0,33	0,24	0,23	0,24	0,26	0,29

source: Tests of football judges organized by the College of Judges
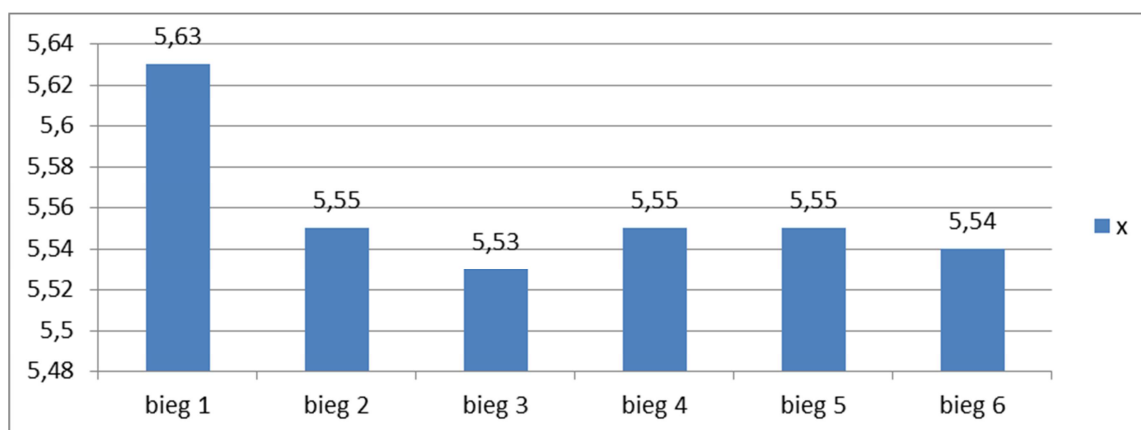Lublin Football Association.

Fig. 3. Average results from short runs of the day 18.10.2016r

Average running time of 1st run was set 5,63 s ± 0,33. The difference between the best and the worst result was 1,17 s. In the case of 2nd run the average result of all the participants was 5,55 s ± 0,234. The difference between the best and the worst result was 0,93 s. Average running time of 3rd run was set 5,53 s ± 0,23. The difference between the best and the worst result was 0,82 s. In the case of 4th run the average result of all the participants was 5,55 s ±0,23. The difference between the best and the worst result was 0,94s. Average running time of 5th run was set 5,55 s ±0,26. The difference between the best and the worst result was 0,95s. In the case of 6th run the average result of all the participants was 5,54 s ± 0,29. The difference between the best and the worst result was 1,01 s (tab. 3, ryc.3).

Tabela 4. Results of the short run of day 14.03.2017r.

LP	*Lublin* INITIALS	1st RUN	2nd RUN	3rd RUN	4th RUN	5th RUN	6th RUN
1	B.J.	5,67	5,59	5,68	5,77	5,83	5,68
2	G.M.	5,86	5,87	5,83	5,88	5,66	5,84
3	K.B.	5,86	5,59	5,64	5,64	5,66	5,86
4	K.Pa.	6	6,01	6,01	6,05	6,13	6,12
5	K.Pi.	5,6	5,44	5,49	5,47	5,47	5,48
6	K.Ma.	5,5	5,79	5,87	5,93	5,88	5,98
7	K.T.	5,88	5,46	5,35	5,5	5,5	5,46
8	K.M.	5,71	5,69	5,72	5,72	5,77	5,73
9	K.P.	5,82	5,97	5,84	5,9	5,87	5,82
10	K.D.	5,43	5,77	5,44	5,65	5,39	5,57
11	K.M.	5,8	5,6	5,52	5,59	5,46	5,61
12	P.J.	6,03	5,9	5,87	5,89	5,9	5,96
13	R.W.	5,97	6,02	5,95	5,82	5,8	5,88
14	R.R.	5,58	5,6	5,54	5,66	5,53	5,44
15	S.P.	5,51	5,43	5,31	5,32	5,34	5,2
16	S.Ł.	5,78	5,8	5,8	5,61	5,65	5,78
17	T.P.	5,65	5,72	5,64	5,61	5,63	5,67
18	W.K.	5,1	5,1	5,06	5,12	5,17	5,14
19	W.M.	5,51	5,51	5,48	5,64	5,59	5,71
	x	5,70	5,68	5,79	5,67	5,64	5,68
	SD	0,23	0,23	0,78	0,22	0,23	0,26

source: Tests of football judges organized by the College of Judges
Lublin Football Association.

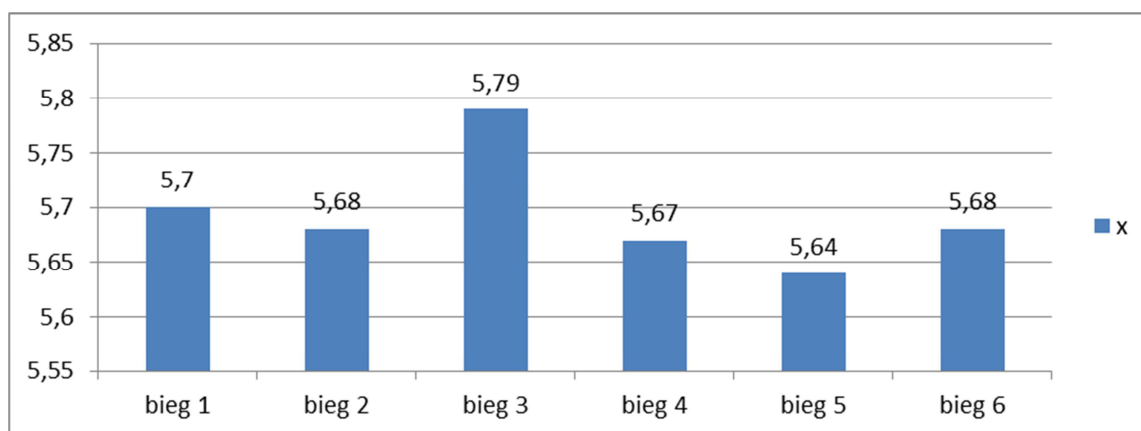**Fig. 4**. Average results from short runs of the day 14.03.2017r.

Average running time of 1st run was set 5,70 s ± 0,23. The difference between the best and the worst result was 0,93 s. In the case of 2nd run the average result of all the participants was 5,68 s ± 0,23. The difference between the best and the worst result was 0,92 s. . Average running time of 3rd run was set 5,63 s ± 0,25. The difference between the best and the worst result was 0,95 s. In the case of 4th run the average result of all the participants was 5,67 s ±0,23. The difference between the best and the worst result was 0,93 s. Average running time of 5th run was set 5,64 s ±0,23. The difference between the best and the worst result was 0,96 s. In the case of 6th run the average result of all the participants was 5,68 s ± 0,26. The difference between the best and the worst result was 0,98 s (tab. 4, fig. 4).

Tabela 5. Results of the short run of day 30.05.2017r.

LP	*Lublin* INITIALS	1st RUN	2nd RUN	3rd RUN	4th RUN	5th RUN	6th RUN
1	B.J.	5,66	5,71	5,33	5,59	5,59	5,45
2	G.M.	5,85	5,81	5,77	5,82	5,83	5,81
3	K.B.	5,79	5,81	5,77	5,82	5,83	5,78
4	K.Pa.	6,1	6,03	6,01	6,15	6,03	6,01
5	K.Pi.	5,64	5,37	5,42	5,54	5,47	5,57
6	K.Ma.	6,05	5,78	5,84	5,85	5,83	5,83
7	K.T.	5,81	5,72	5,73	5,66	5,75	5,65
8	K.M.	5,63	5,55	5,53	5,57	5,57	5,49
9	K.P.	5,81	5,72	5,77	5,77	5,61	5,79
10	K.D.	5,48	5,39	5,73	5,6	5,59	5,52
11	K.M.	6,09	5,69	5,82	5,81	6,05	5,94
12	P.J.	6,04	5,78	5,89	5,89	5,86	5,73
13	R.W.	5,52	5,3	5,77	5,34	5,38	5,36
14	R.R.	5,44	5,37	5,32	5,23	5,3	5,32
15	S.P.	5,78	5,65	5,73	5,65	5,58	5,66
16	S.Ł.	5,69	5,81	5,73	5,75	5,72	5,61
17	T.P.	5,28	5,2	5,1	4,97	5,09	5,13
18	W.K.	5,9	5,88	5,89	5,87	5,72	5,71
19	W.M.	5,46	5,43	5,52	5,5	5,53	5,49
	x	5,74	5,63	5,67	5,65	5,65	5,62
	SD	0,24	0,23	0,23	0,27	0,24	0,22

source: Tests of football judges organized by the College of Judges
Lublin Football Association.

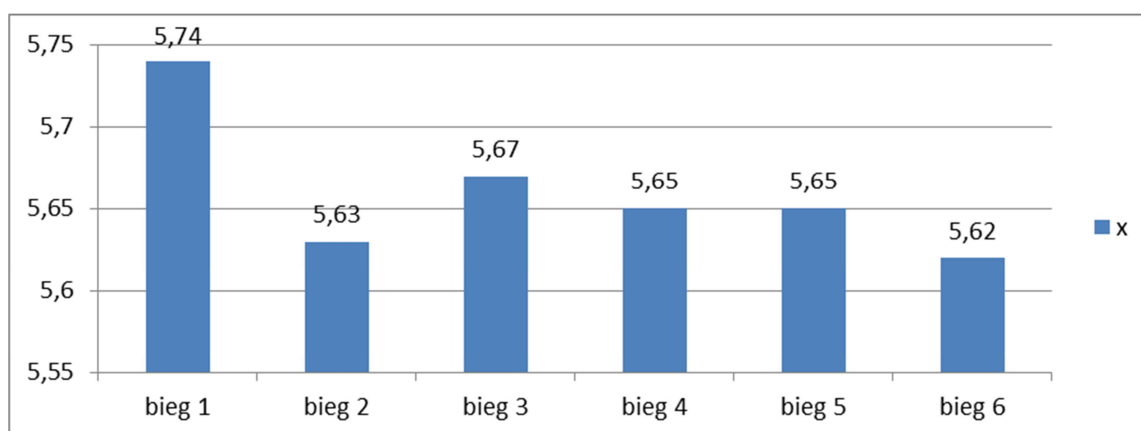**Fig. 5**. Average results from short runs of the day 30.05.2017r.

Average running time of 1st run was set 5,74 s ± 0,24. The difference between the best and the worst result was 0,81 s. In the case of 2nd run the average result of all the participants was 5,63 s ± 0,23. The difference between the best and the worst result was 0,83 s. Average running time of 3rd run was set 5,67 s ± 0,23. The difference between the best and the worst result was 0,91 s. In the case of 4th run the average result of all the participants was 5,65 s ±0,27. The difference between the best and the worst result was 1,18 s. Average running time of 5th run was set 5,65 s ±0,24. The difference between the best and the worst result was 0,96 s. In the case of 6th run the average result of all the participants was 5,62 s ± 0,22 The difference between the best and the worst result was 0,88 s (tab. 5, fig. 5).

Table 6. Results of the interval run

	Interval runs	**7.09.2016 r.**	**18.10.2016 r.**
LP	**INITIALS**	**Number of laps**	**Number of laps**
1	B.J.	12	12
2	G.M.	12	12
3	K.B.	12	12
4	K.Pa.	12	12
5	K.Pi.	12	12
6	K.Ma.	12	12
7	K.T.	12	12
8	K.M.	12	12
9	K.P.	12	12
10	K.D.	12	12
11	K.Ma.	12	12
12	P.J.	12	12
13	R.W.	12	12
14	R.R.	12	12
15	S.P.	12	12
16	S.Ł.	12	12
17	T.P.	12	12
18	W.K.	12	12
19	W.M.	12	12
	x	12	
	SD	0	

source: Tests of football judges organized by the College of Judges
Lublin Football Association.

In both dates (7.09.2016 and 18.10.2061), each of the examined football judges received a maximum score (12 laps) (tab. 6).
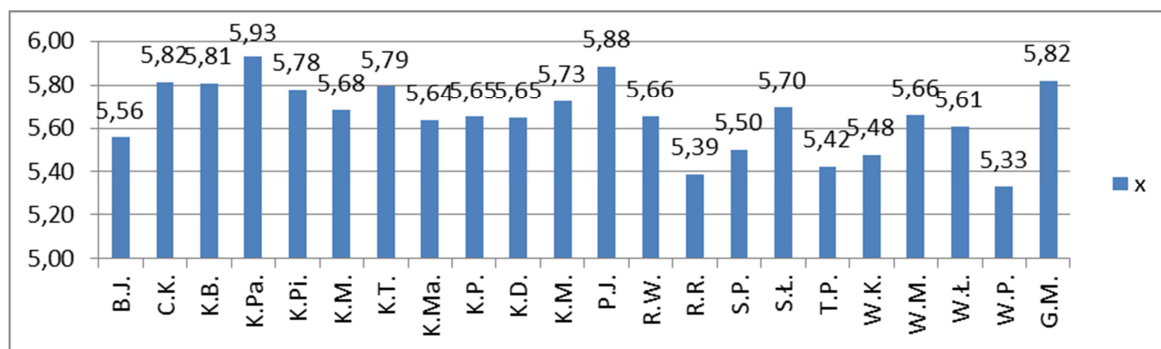

Fig. 6. Average results from each of the 4 measurements

On the basis of Figure 6 it can be stated that on average the best one was W.P. with the average of 5,33s. The worst K.Pa. with the average of 5,93s.

SUMMARY AND CONCLUSIONS

The results of the study may be useful for observers working for arbitrators and for football judges themselves, to improve performance. In addition, they can be a source of information to help create more effective training plans for football referees. On the basis of the above data it was found that the best average results were obtained by the respondents in the first term and the worst in the third. Taking into account all test dates and trials, it can be said that the statistically the best results were obtained in the 5th trial, and the worst in the 1st. In the case of endurance tests, on both dates (7.09.2016 and 18.10. 2016), each of the tested football judges passed 12 interval laps which entitle him to qualify for promotion to the higher leagues.

Obtained results indicate that:

1. The average level of fitness of the IV football leagues in the 2016/2017 season was very good at the speed tests, with each athlete scoring the highest possible score.
2. There was no relationship between the results in the strength and speed tests, due to the attainment of all tested results by the maximum in the strength test.
3. The judges of the IV league season 2016/2017 were the best in October 2016, the worst in March 2017.

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