

A Comparative Study of Anthropometric and Physical Fitness Profile Among Top Football Referees In Iran

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Abstract

This study investigated the physical fitness profile of elite football referees in Iran. It was of descriptive-correlation studies which was done in field. Subjects were all referees called for pre-season class of Iran's Premiere League, both national and international referees. Data collection were from standard tests including 60 m sprint, FIFA advanced Cardio-Vascular Endurance (150 m intervals running) Test, 4*9 agility test, height and weight measurement, BMI calculating, measuring subcutaneous fat layer thickness and estimating BFP. Results showed that the average height of subjects was 1.81, average weight 75.96, average BMI 23.10, and average BF was 16.97%. Also, investigating 4 aspects of physical fitness of Iran's top referees showed that in sprint factor, the average of records for 30 subjects of this research was 6.07 seconds, the average distance completed for cardio-vascular endurance factor was 4186.66 m, the average of records for flexibility was 31.68 cm, and finally for agility factor the average record was 8.95 seconds. Results showed that there was no significant difference in anthropometric factors between national level and international level referees, but a significant difference in physical fitness factors.

Key Words: Anthropometry, Physical fitness, Profile, Football referee.

Introduction

Elite sportspeople in highest levels do not appear at once. Physical fitness and skills are the result of years of exercise and efforts of coaches that have planned with great patience. The physiological profile of elite sportspeople has been studied in depth during the recent years, providing information about their physical fitness and response to training workloads. In the case of soccer, research has focused on the players profile (Bangsbo et al., 2006; Junge et al, 2000) with less attention being paid to the physiological characteristics of those responsible for the fulfilment of the laws of the game, namely, the refereeing team (Caballero & Ojeda, 2011). Referees play a crucial role in modern soccer and the importance of their decisions during match-play can be critical for the final score of the match (Caballero & Ojeda, 2011).

Football refereeing is an exhausting profession because it needs lots of energy, tolerance and care, and at the same time it is not free of dangers and physical injuries (Azadan, 2000). The first step in designing and implementing exercises special for referees is understanding special needs of this profession. Designing plans for exercises regarding these needs and also according the features of each referee is very important (Christopher, 2000; Castagna et al., 2007). To achieve the peak performance and on-time presence at events of the match, referees have to improve their speed, endurance, agility and balance (Castagna et al., 2007). Since the referee is responsible for controlling the behavior of players and also in order to enforce the laws of the game and necessity for harmonic movement with the game, it is necessary to look at the performance of referees in a scientific manner (Mogham, 2007). In this case, researches have shown that there is a positive relationship between the distance ran by referee and his/her positioning to view the foul scene (Castagna et al., 2007). Therefore, having a good level of physical fitness play an important role in his/her success.

Researches done on work rate of referees during the match shows that referees of elite levels run 9 to 13 km in every match (Mabhut et al, 2012; Esmaeili et al., 2010). Distance ran by Iranian referees is lower than those reported in foreign studies. A glance at previous studies shows that little research has been done on referees as enforcer of rules than football players, and this research gap is wider in our country than others that have had a more scientific look at judgment and refereeing. Maximum and minimum of mentioned distance for Iranian referees were 9910m and 6720m. This difference could be attributed to factors such as physical fitness primarily and playing style of teams in the second (Mabhut et al., 2012). Caballero and Ojeda (2011) mentioning the

important and critical role of referees in football conducted a research in Spain to investigate the physiological features of referees both in lab and field such as height, weight, BMI, Vo2max, sprint, cardio-vascular endurance. This descriptive study conducted on 22 male referees in Spain and showed that the average height, weight and BMI of them were 1.77m, 77.1kg, 24.6 kg/m² respectively. The average time in which they completed each of 40m sprints was 5.53 seconds. Subjects in that research completed 2000m run averagely in 7.43 minutes, the best was 7 min.

Aboa et al (2011) studied class 1 and class 2 referees of J-League. The average height and weight of class 1 referees were 172 cm and 65 kg respectively. Those values were 175 cm and 66 kg in class 2 referees. Casajus and Castagna (2007) in a research on Spanish elite referees resulted that the average values for anthropometric factors (Height, weight, and BMI) were respectively 1.79m, 78kg, and 24.92 kg/m². Castagna et al (2004) in a research "Activity profile of international referees during official matches" conducted on 13 international referees and 13 national referees from different countries resulted that the average height of international referees was 182 cm, the same for national referees (s.d for intl = 6.5 cm, for nationals = 3.5 cm). Harley et al (2002) stated that there is a positive relationship between completed distance by referee and his/her good positioning to view the fouls. Bangsbo (2004), Krustup and Bangsbo (2001) stated in their studies that according to gathered data it seems that distances completed by referees are similar to those of mid-field players, a similarity that could be attributed to the need of referee to see well, to judge well and to avoid possible events.

Regarding the importance of referees role in football, the present study is going to investigate the anthropometric and physical fitness profile of Iran's top football referees. Conducting specialty tests of physical fitness and measuring the status of Iran's top football referees defines their margins of physical capabilities to design the exercising program of each referee according to the rule of individual differences. On the other hand, providing the profile of physical fitness for referees will be a criterion to compare other referees with those results, while describing the present conditions. The results of physical fitness tests highlight the strengths and weaknesses of exercising programs and provide practical ways to review the possible progress or stagnation of referees. It seems clear that there is no scientific planning regarding the exercises and preparation of Iranian referees. Results of this research could be helpful in this case. We tried to select those factors of physical fitness that are most relevant to referees performance.

Methodology

The present study was a descriptive-comparative one which was done in field. Height, weight, BMI, BF, Cardio-vascular endurance, sprint, agility and flexibility were the variables of this study. Subjects were all football referees (field referees) called for pre-season meeting of 2014-2015 for Iran's Premiere League including both national and international referees (30 referees). Data were gathered using standard tests (FIFA standard 60m sprint, FIFA advanced high-intensity test, 4*9 agility test, sit and reach test, height measurement, weight measurement, BMI calculating formula, and BF calculating. To analyze data we employes Clomogrov-Smirnov tests, independent samples t test and descriptive statistics (P≤0.05). All data were analyzed using SPSS20.

Results

Descriptive statistics showed that for 23 national referee out of 30 top referees, height, weight, BMI, and %BF average is respectively 1.81m, 75.91kg, 23.04 kg/m², and 17.17. Full report is shown in table1.

Table 1. Anthropometric factors of national referees.

	N	Min	Max	Average	S.D
Height	23	1.72	1.93	1.81	0.055
Weight	23	68	84	75.91	4.45
BMI	23	20.90	25.54	23.04	0.99
BF	23	16.13	18.21	17.17	1.04

Also descriptive statistics showed that the average value of flexibility, sprint, cardio-vascular endurance, and agility factors for national referees are 30.80 cm, 6.11 seconds, 4017 m, and 9.02 seconds respectively which are shown in depth in table 2.

Table 2. Physical fitness factors of national referees.

	N	Min	Max	Average	S.D
Flexibility	23	27	35	30.80	2.22
Sprint	23	5.90	6.30	6.11	0.12
Endurance	23	3200	4800	4017.39	306.96
Agility	23	8.30	9.63	9.02	0.32

International referees' records for anthropometric factors are shown in table 3. Their average values for height, weight, BMI, and %BF were respectively 1.80 m, 76.14 kg, 23.29 kg/m², and 16.33.

Table 3. Anthropometric factors of international referees.

	N	Min	Max	Average	S.D
Height	7	1.75	1.90	1.80	0.057
Weight	7	68	87	76.14	7.35
BMI	7	22.09	24.26	23.29	0.95
BF	7	15.17	17.50	16.33	1.16

Physical fitness factors (flexibility, sprint, endurance and agility) average values for international referees were 34.57 cm, 5.94 seconds, 4742 m, and 8.72 seconds. These data are shown in table 4.

Table 4. Physical fitness factors of international referees.

	N	Min	Max	Average	S.D
Flexibility	7	31	39	34.57	3.22
Sprint	7	5.80	6.10	5.94	0.09
Endurance	7	4400	4800	4742.85	151.18
Agility	7	8.35	8.95	8.72	0.23

To compare Anthropometric factors between national and international referees we employed independent samples T test. As shown in table5, in all of anthropometric factors the difference between national and international referees was not significant. So we can claim that there is no significant difference between national and international referees in anthropometric factors.

Table 5. T test results: Anthropometric factors comparison between national & intl. refs.

	Leven's test			T test		
		F	Sig.	T	df	Sig.
Height	Equal variances assumed	0.029	0.86	0.39	28	0.69
	Equal variances not assumed			0.38	9.64	0.71
Weight	Equal variances assumed	3.47	0.073	0.10 -	28	0.91
	Equal variances not assumed			0.07 -	7.38	0.94
BMI	Equal variances assumed	0.218	0.64	0.60 -	28	0.55
	Equal variances not assumed			0.61 -	10.26	0.55
BF	Equal variances assumed	0.012	0.912	1.80	28	0.08
	Equal variances not assumed			1.70	9.18	0.12

To test the difference in physical fitness factors between national and international referees, again we employed independent samples T test. Results showed that there is difference and the difference is significant (table 6). Although the significance is marginal in the case agility but in total we can claim that there is a significant difference in physical fitness factors between national and international referees.

Table 6. Physical fitness factors comparison between national & intl. refs.

	Leven's test			T test		
		F	Sig.	T	df	Sig.
flexibility	Equal variances assumed	1.93	0.17	3.52 -	28	0.001
	Equal variances not assumed			2.88 -	7.81	0.021
sprint	Equal variances assumed	1.29	0.26	3.37	28	0.002
	Equal variances not assumed			3.83	12.44	0.002
endurance	Equal variances assumed	0.49	0.48	5.98 -	28	0.000
	Equal variances not assumed			8.45 -	21.34	0.000
agility	Equal variances assumed	0.47	0.49	2.26	28	0.032
	Equal variances not assumed			2.66	13.38	0.019

Discussion and Conclusion

It seems that in general, Iran's top football referees are in a suitable status regarding anthropometric factors. Although anthropometric factors are not limiting factors, in professional football the trend is forward finding tall referees (Krustrup et al., 2009; Malo et al, 2005) because it could be expected that referee's height provides him more physical power to enforce the laws of the game. Anthropometric and physical fitness factors of these referees in general are similar to those of referees studied in literature (Hopkins et al., 2009; Galanti et al., 2008). Main anthropometric features (height and BMI) of these referees are similar to those of Spanish elite referees (Casajus & Castagna, 2007) and BMI values in this research was very close to those reported for referees officiating in final games of Euro 2000 (Helsen & Bultynck, 2004).

According to results of sprint test, we must acknowledge that Iranian referees are not in a good status comparing to referees of advanced countries. Although the best record in this case was 5.80 seconds, the average for Iranian referees was not so promising. This could be attributed to several reasons. Regarding to this point that the author himself is a national referee and aware of facts in this case, it seems that most of referees do not try to improve their physical fitness and show their real status, rather they try only to pass the tests. So the test do not reflect their real physical fitness status. On the other hand, those involved in refereeing department of football federation suffice only to these tests and have no more evaluating programs. Another reason for this incongruity is the difference in referees ages where Iranian referees were older than referees in other countries. Here we must state that international referees of Iran were in a good status regarding international standards of physical fitness. This is natural because International matches put more tension on referees and as a result needs a better physical fitness. Studies show that different aspects of activity and physiological needs of referees during matches have great similarities to each other and this approach is completely related to performance of players (Weston et al., 2008).

So refereeing international matches needs better physical fitness status that could be seen in differences of physical fitness results between national and international referees. Another reason for the differences of physical fitness status between national and international referees could be attention of FIFA and AFC to physical fitness of referees, as FIFA wants referees candidates for World Cup to send their physical fitness reports every month. Studies for precise analysis of matches show that physical needs experienced by referees is getting more and more in recent years (Castagna et al., 2007; Krustup et al., 2009). Finally according to the results we must state that:

- Iranian top referees showed an average performance in aerobic and anaerobic fields that indicates the need to improve physical fitness capacity of Iranian referees specially national ones to meet the requirements of matches.
- Regarding this point that one of the most important factors in success of referees in sport fields is having physiological capacities and special physical features, knowing about Anatomic aspects of referees such as height, weight, BF and BMI could show new areas of consideration for those involved in management of refereeing departments. It is proposed that managers in this field to check the anthropometric and physical fitness factors periodically not as criteria to pass or fail but as data to successfully plan and design required exercises.

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