

Physical Fitness of Rugby Umpires Based on *Prudential Fitnessgram*[®]

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Received: February 12, 2014 Accepted: February 20, 2014 Online Published: February 28, 2014

doi:10.5539/ass.v10n5p146

URL: <http://dx.doi.org/10.5539/ass.v10n5p146>

Abstract

The aim of this study is to assess health related physical fitness of rugby umpires. Besides that, this study also aims to see whether there is any differences based on the health related components of physical fitness according to age group. The samples of this study were 39 umpires who were involved in a tournament, aged between 20 to 45 years. Test battery used in this study is *Prudential FITNESSGRAM*[®] by *Cooper Institute for Aerobic Research (1992)* which includes PACER 20 meter Multistage run, push up, curl up, trunk lift and body mass index (BMI). Data analysis showed that there is significant difference on the different components of health related physical fitness for the different age groups. The results of this study can be used by the Technical Committee of Rugby Tournaments in Malaysia to ensure that umpires involved in any tournaments has excellent fitness level to avoid from making judgmental decision which may cause tense situation among players, coaches and management. The results of this study is hope to convince all umpires on the importance of good physical fitness as it will positively affect the level of umpiring to be more effective and of high quality.

Keywords: umpires, rugby, physical fitness

1. Introduction

Rugby is a contact sports and need good physical fitness psychomotor skills and specific skills depending on the position played (Merwe, 1989). Throughout a game, players are exposed to collisions, acts of aggression and rudeness either intentionally or unintentionally either during scrambling for the ball, when attacking or defending (Gissane et al., 2001). This can lead to the occurrence of injury to the muscle or bones (Gabbett, 2004).

For the purpose of controlling the roughness and extreme aggression which may cause injury in rugby, the game is monitored by an umpire on the field and two assistant umpires on the left and right field lines known as touch judge. However, in making decisions, it rely solely on the assessment and courage of the umpire. The umpire with a whistle on the field has the greatest role in determining the smoothness of the match (Mellick et al., 2005). Common incidents happen in the blink of an eye and are unique. Either from within or outside the field, those who witnessed an incident have various points of view regarding what happened, and all disagreements and uncertainties requires the umpire to act wisely so that justice is given to players and spectators alike in order for the game to continue.

To control a game, umpires must act fairly and impartially in an effort to ensure the smoothness of the game and to avoid unnecessary roughness in the game. Therefore, in order to perform good quality umpiring, umpires must be able to interact and communicate with the players, master the laws and regulations of the game as well as good physical fitness. With all these, it is hope that umpires can perform optimally no matter their age group or level of competition that they are umpiring (Chuskelly, 2006).

Earlier researches prove that communication between umpires and players is important to ensure the smooth running of the match. Simmon (2007), presented and identified three meta characteristics related to umpires which influences players perception of justice. Players see fairness when they believed that umpires are 'skilled' to make evaluate and make decision, is 'reliable' under various stresses of the match, 'respect' and 'responsible' for the players. Research also found that players are sensitive to the three qualities mentioned above, and to some portrayals of either verbal or non-verbal actions for example clothing, anger, hearing acuity and age of umpires has strong influence on players perception of umpires' fairness.

Previous studies also showed that umpires' decision is also influenced by the noise levels of the spectators (Balmer et al., 2007), the context of the game (Mascarenhas et al., 2005), umpires psychological state which is

related to past experience (Boyko et al., 2007) and also umpires' bias in selecting a team as favourite and the other as underdog (Bar Eli et al., 2006) or in favour of one team over the other (Mohr & Larsen, 1998). Physical condition of the field either dynamic or in a bad state also influences the style and rhythm of a game and these need and experienced and highly skilled umpires to control the situation and calm down players, nevertheless, no research has been conducted the physical fitness level of the umpires which is also a contributing factor to ensure that decisions made in an incident is the right decision and is not controversial.

In Malaysia, various studies has been conducted on health based physical fitness and psychomotor based physical fitness among rugby players, but thus far, no research has been conducted on health related physical fitness components of rugby umpires before umpiring games in a tournament. A study by Nizam Nazaruddin (2013), which uses Polar Personal Trainer RC3 GPS with heart rate and run rate detector technology has helped increased the quality of umpiring in rugby besides monitoring umpires' level of fitness and health during umpiring a match. The tool is used to compare the resting heart rate and distance covered when umpiring a rugby match, however, the umpires' level of fitness is only known after the completion of a match. Kraak, Dawie, Malan and Van den Berg (2011) have conducted similar study for the National Club Rugby Championship (NCRC) with the consent of South African Rugby Referee Association (SARRA).

This study is different from other research in that it aims to evaluate the level of health related components of physical fitness among rugby umpires before umpiring a match in order to ensure that umpires has a good level of fitness before satisfactorily performing their duties. In a senior category rugby game, a match takes about 80 minutes, which requires an umpire to be as physically fit as the players. This is because a rugby umpire needs to be in close situation with the ball position so that the right decisions are made this ensuring the smoothness of the match and offense committed were judged correctly. Therefore, level of physical fitness of a rugby umpire is important and should be given serious consideration.

According to Corbin and Lindsey (1994), physical fitness is the overall fitness of the human organism to function efficiently and effectively. Physical fitness consists of eleven components that contributes to the quality of life and is associated to an individual's ability to work effectively, to enjoy leisure, to be healthy, to fight hypokinetic diseases and able to react during emergencies. In general, physical fitness is dependent on each and every component of exercise, diet and also active lifestyle.

Physical fitness is divided into two namely, health related fitness and psychomotor related fitness. The components of health related fitness were cardiovascular endurance, muscular endurance, muscular strength, flexibility and body composition, while the components of psychomotor related fitness were speed, agility, power, balance, coordination and reaction time (Harun & Salamuddin, 2007; Morrow, 2005; Hashim, 2004; Baumgartner & Jackson, 2002; Corbin & Lindsey, 1988; Fall, 1980).

In the context of this research, health related components of physical fitness are the batteries to test the physical fitness of rugby umpires. In this study, physical fitness is defined as ability of a person to move actively and react in an emergency situation without feeling tired and fatigue. Specifically, health related physical fitness involves physiology and psychological aspects to help protect a person from health problems such as cardiovascular diseases, obesity and mental-emotional problems (Harun & Salamuddin, 2007). In addition, physical fitness can help to monitor the state of health of the umpire and prevent untoward incidences regarding health problems while umpiring on the field.

2. Methodology

This is an experimental ex post facto study which is simple but has a high internal validity (Piaw, 2006; Thomas & Nelson, 1996). It is a cross sectional post test only design which facilitates the collection of data (Golding, Meyers & Sining, 1989). The sample of this study is rugby umpires selected for a rugby championship. The level of physical fitness is measures using The Prudential FITNESSGRAM[®] (Cooper Institute for Aerobics Research, 1992) and the procedures for data collection are as stated by Baumgartner and Jackson (1999). The five test batteries used were PACER Multistage Shuttle Run, push up, curl up, trunk lift and body mass index. Each test battery has a reliability factor between 0.86 to 0.98.

3. Results

Table 1 shows the distribution of samples according to age group. Twenty two samples (56.41%) of the umpires in this study are above thirty six years old.

Table 1. Distribution of samples according to age group

Age Group	n	%
20-25	3	7.69
26-30	8	20.52
31-35	6	15.38
36-40	10	25.64
40-45	12	30.77
Total	39	100

Table 2. Descriptive statistic of samples according to age group and test batteries

Age Group in years	Test Batteries				
	PACER	Curl Up	Push Up	Trunk Lift	BMI
20 - 25 (n=3)	45.03 (sd=2.90)	45.33 (sd=4.72)	43.00 (sd=2.64)	45.33 (sd=1.15)	26.26 (sd=2.88)
26 – 30 (n=8)	45.48 (sd=3.39)	46.62 (sd=4.83)	44.12 (sd=2.99)	54.12 (sd=4.18)	25.60 (sd=1.09)
31 – 35 (n= 6)	46.43 (sd=3.07)	48.16 (sd= 5.11)	45.33 (sd=3.88)	46.50 (sd=10.72)	26.60 (sd=1.37)
36 – 40 (n=10)	42.12 (sd=5.82)	48.00 (sd=5.18)	45.20 (sd=2.61)	45.50 (sd=6.15)	26.65 (sd=1.52)
40 – 45 (n=12)	44.79 (sd=4.77)	45.16 (sd=3.85)	41.58 (sd=4.29)	47.66 (sd=9.10)	26.47 (sd=1.72)

Table 2 shows the mean and standard deviation for the test batteries conducted according to the age group. Data shows that the umpires in 31 to 35 years age category has the best score for cardiovascular endurance and muscular endurance and muscular strength, Surprisingly, umpires in the 40 to 45 years age category has the best flexibility and those in the 26 to 30 years age category has the lowest body fat composition as indicated by their body mass index.

Table 3 shows the physical fitness norms for the test batteries that were conducted and the descriptive statistics of the sample of this study according to the norms. Based on the results shown in Table 3, none of the umpires in the sample has excellent cardiovascular endurance level, shown by results of PACER test and only 1 (2.56%) umpire has excellent muscular endurance (curl ups), muscular strength (push ups) and flexibility (trunk lifts). Majority of the umpires were in the good and very good levels of physical fitness as shown by the results of each test battery. However, it should be noted that there are about 10 umpires or 25% of the sample in this study who were in the average and poor category.

Looking at the results of the body mass index, none of the umpires is in the underweight and obese categories. However, it should be noted that majority (74.36%) of the umpires are overweight. This should not be the case as umpires are regarded as role models on the field.

The results showed that rugby umpires need to be more physical fit to ensure that they are able to keep up with the game. Furthermore, fitness is important to avoid injuries during umpiring.

Table 3. Norms and achievement results of physical fitness test

Test Batteries	Test Levels	Age Groups										Total	
		20-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70		
PACER	Excellent	49.39	-	50.59	-	51.05	-	50.52	-	52.00	-	-	
	Very Good	46.49-49.38	1	47.19-	4	47.98-	3	45.04-	3	47.18-	3	14	
				50.58	51.04	50.51	51.99	(35.89%)					
	Good	43.58-46.48	1	43.78-	1	44.89-	2	39.21-	5	42.39-	8	17	
				47.18	47.97	45.03	47.17	(43.59%)					
	Average	40.68-43.57	1	40.38-	3	41.82-	-	33.72-	-	37.59-	-	4 (10.26%)	
				43.77	44.88	39.20	42.38						
Poor	40.67	-	40.37	-	41.81	1	33.71	2	37.58	1	4 (10.26%)		
Excellent	52.42	-	53.87	-	55.87	-	55.81	-	50.97	1	1 (2.56%)		
Curl up	Very Good	47.70-52.41	1	48.33-53.86	4	50.77-55.86	2	50.61-55.80	4	47.10-50.96	3	14	
	Good	42.97-47.69	1	44.20-48.32	2	45.56-50.76	3	45.40-50.60	4	43.23-47.09	4	14	
				44.20-48.32	45.56-50.76	45.40-50.60	43.23-47.09	(36.89%)					
	Average	38.25-42.96	1	39.38-44.19	1	40.46-45.55	-	40.20-45.39	1	39.36-43.22	3	6 (15.38%)	
				39.38-44.19	40.46-45.55	40.20-45.39	39.36-43.22						
	Poor	38.24	-	39.37	1	40.45	1	40.19	1	38.35	1	4 (10.26%)	
	Excellent	46.97	-	48.63	-	51.16	-	49.12	1	48.02	-	1 (2.56%)	
Very Good	44.33-46.96	1	45.63-48.62	3	47.28-51.15	2	46.52-49.11	1	43.73-48.01	4	11		
			45.63-48.62	47.28-51.15	46.52-49.11	43.73-48.01	(28.21%)						
Push up	Good	41.68-44.32	1	42.62-45.62	3	43.39-47.27	2	43.89-46.51	6	39.44-43.72	5	17	
	Average	39.04-41.67	1	39.62-42.61	2	39.51-43.28	2	41.29-43.88	1	35.15-39.43	1	7 (17.95%)	
				39.62-42.61	39.51-43.28	41.29-43.88	35.15-39.43						
	Poor	39.03	-	39.61	-	39.50	-	41.28	1	35.14	2	3 (7.69%)	
	Excellent	47.07	-	60.43	1	62.61	-	61.37	-	54.74	4	5 (12.82%)	
	Very Good	45.94-47.06	2	56.23-60.42	1	51.91-62.60	2	52.27-61.36	3	48.61-54.73	2	10	
				56.23-60.42	51.91-62.60	52.27-61.36	48.61-54.73	(25.64%)					
Trunk lift	Good	44.73-45.93	1	52.02-56.22	3	41.10-51.90	3	43.06-52.26	3	42.40-48.60	3	13	
	Average	43.60-44.72	-	47.82-52.01	3	30.40-41.09	-	33.96-43.05	4	36.27-42.39	2	9 (23.07%)	
				47.82-52.01	30.40-41.09	33.96-43.05	36.27-42.39						
	Poor	43.59	-	47.81	-	30.39	1	33.95	-	36.28	1	2 (5.13%)	
	Under weight <18.5	-	-	-	-	-	-	-	-	-	-	-	
	Normal 18.5-24.9	2	2	1	2	3	3	4	5	6	7	8	10
Body mass index	Overweight	25.0-29.9	1	6	5	8	9	29					
	Obese I 30.0-34.9	-	-	-	-	-	-	-					
									(74.36%)				
	Obese II 35.0-39.9	-	-	-	-	-	-	-					
	Obese III >39.9	-	-	-	-	-	-	-					

4. Conclusion

This study on physical fitness performance of rugby umpires were analysed based on descriptive data. The data

is compared with established norms. It can be concluded that, rugby umpires need to be more physically fit to ensure justice when umpiring a match. Umpires must always be in a position close to the ball, where the action is, in order to make the right decision. If umpires lagged behind in a game, rugby, being a contact sport can cause high aggression which may break into a fight among the players. Fighting among players may cause further incidents involving spectators, and the umpire themselves. Besides being able to umpire a match fairly, being physically fit will reduce rate of injuries among umpires. It can also avoid incidences such as cardiac arrest when overweight umpires had to carry extra weight around on the field.

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