21. REFEREES AND FANS

O-122 Physical demands and distance at infringements for football referees in international games

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OBJECTIVES Over the last decade, much knowledge has been obtained about the activity profile and physical demands of football referees in national league games as well as international games (Krustrup and Bangsbo 2001; Castagna et al. 2004; Helsen and Bultynck, 2004; Weston et al. 2006). However, the physical demands throughout international games and the relationship between high intensity running and the referees' ability to keep up with play are still to be investigated. The aim of the present study was to investigate the activity profile and physiological demands of referees in international games and to examine possible decrements in total distance covered (TD), high intensity running (HIR) and backwards running (BR) during the game. It was also studied whether the referees' ability to keep up with play was related to the amount of high intensity running.

METHODS Computerised time-motion analyses (Krustrup and Bangsbo, 2001) and measurements of heart rate (HR) were performed on 12 referees during 4 Champions League, 4 UEFA Cup and 4 national games. In addition, five referees had finger prick blood samples taken at half time and after the game for measurements of blood lactate.

RESULTS TD, HIR and BR were 10.30 (0.28) (SEM), 1.87 (0.20) and 0.86 (0.08) km, respectively. Mean HR was 150 (3) bpm. Blood lactate was 4.1 (1.2) and 6.1 (1.6) mmol/l after first and second half. TD and BR decreased ($p<0.05$) by 11% and 48% from 0-15 to 75-90 min, but HIR was unaltered. HIR was negatively correlated with peak5-attacking-zone distances to infringements in both halves ($r=-0.56$ and -0.72, $p<0.05$).

DISCUSSION The present study shows that the physical demands are high for referees throughout international games. Thus, blood lactate values were high after the game, and the distance covered by high intensity running was kept high in the last 15-min period. The study furthermore demonstrated that referees' ability to keep up with play is related to the amount of high intensity running performed.

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KEYWORDS: High intensity running, blood lactate, heart rate, distance at infringements.

O-123 Rugby football as a moral agent

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OBJECTIVES Fair play spirit is supposed to be the most important aspect of football. This paper attempts to clarify the educational value of rugby football through analyzing the educational theory of H. H. Almond (1832-1903) who regarded football as a moral agent. This paper aimed at examining the circumstances in which Almond thought rugby football as an important moral agent for character building in students. In addition to it, this paper attempted to expand the framework of scientific research for football by bringing in moral aspects.

METHODS This paper is a meta-analysis of the fair play spirit. Analyzing in detail H.H.Almond's articles, letters, and so on. The main material is the article, 'Football as a moral agent', Nineteenth Century, 34, 1893.

RESULTS Almond's Loretto School made physical education the essential part of school practice. He thought of football as a moral agent that made students unselfish. Because of the characteristic of rugby football, the game cannot be maintained if players don't have fair play spirit. Almond said that 'There must be a certain amount of bona fides in it, or it soon becomes no game at all. But from the professional player we cannot expect this bona fides.' As IRB playing Charter said, 'Rugby is rightly proud of its ability to retain high standards of sportsmanship, ethical behaviour and fair

play.' Especially, the age which Almond wrote the article, the problem of professionalization is under debate. In this situation, he promoted to build up the fair play spirit of rugby football in students.

DISCUSSION Almond established a regimen of sound living that embraced diet, dress and exercise, which would train the character of students. He also adopted rugby football because it made 'the training-ground of a virtue which is so far modern that it has not yet acquired a distinctive name'. The review of the educational theory and practice of Almond has indicated that rugby football could be correlated with the mode of life of students. In this sense football is not only an exercising tool for the body but also for the soul. Forming of fair play spirit, the character of rugby football was intertwined with the holistic education.

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KEY WORDS: Football and education, moral agent, bona fides.

O-124 Activity profile and heart rate response of referees in Gaelic football

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OBJECTIVES: Distances covered by soccer referees during matches (D'Ottavio and Castagna, 2001) can be greater than those covered by players. Therefore, it is important for referees in football codes to have specific fitness developed through training based on an understanding of the physiological demands of refereeing. To date, the physiological demands of refereeing in Gaelic football have not been investigated. Thus, the purpose of the current investigation was to use global positioning technology (GPS) and heart rate monitoring devices to provide an understanding of the physiological demands of refereeing during Gaelic football matches.

METHODS: Eight referees wore a GPS receiver, the Sports Performance Indicator (SPI 10, GPSports Systems, Australia), which was carried in a padded back-pack just below the neck to provide information relating to the time, speed, distance, position, altitude, direction and heart rate during matches.

RESULTS: Referees performed 51.0 (17.1) bursts of > 18 km/hour covering a mean distance of 15.6m (3.5) during each burst. Mean heart rate of the referees was 164.6 (14.2) beats/min. These results demonstrate that the refereeing of elite-level Gaelic football matches involves intermittent high intensity activity.

DISCUSSION: The mean heart rates and total distances covered were similar to the values reported previously in the literature for soccer referees (Krustrup and Bangsbo, 2001). Moreover, these results provided important data to aid in the development of training programmes to address the intermittent high intensity activity levels of referees in Gaelic football.

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KEY WORDS Referee, work-rate, physiological demands, heart-rate response, motion analysis, Gaelic football.

O-125 Activity profile, heart rate and blood lactate of Futsal referees during competitive games

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OBJECTIVES Futsal has become a popular indoor alternative to football. However, the scientific knowledge regarding the physical demands of Futsal playing is rather limited and so far, no studies have investigated the activity profile and physiological demands of Futsal refereeing. The aims were to investigate the activity profile during competitive games, including number of activity changes, total distance covered (TD), high intensity running (HIR; >15 km/h), sprinting (SPR) and sideways running (SR) and to examine the physiological demands in games by measuring heart rate and blood lactate. In addition, training status of high-level Futsal referees was determined.

METHODS Twelve high-level Portuguese Futsal referees with an average age, height, weight and fat percentage of 33 (5) (SD) years, 1.73 (0.05) m, 73.2 (8.4) kg and 15.7% (5.4) respectively, participated in the study. Their Yo-Yo IE2 performance was 975 (237) (560-1280) m. Video filming (n=6) and heart rate recordings were performed throughout games. Blood lactate was determined at rest and after the game.

RESULTS The number of activity changes was as high as 1771 (314) over ~80 min. TD, HIR, SPR and SR were 5.61 (0.82), 0.93 (0.18), 0.18 (0.07) and 1.00 (0.46) km, respectively. The number of HIR and SPR bouts was 137 (21) and 19 (8), with a mean duration of ~1.3 s. Mean HR was 146 (13) bpm. or 78 (6)% of HRmax. Blood lactate was 1.0 (0.3) and 1.5 (0.5) mmol/l before and after the game.

DISCUSSION The present study showed that Futsal referees performed numerous very brief bouts (1-2 s) of fast speed running and sideways running. The heart rate loading was moderate-to-high during Futsal games. Interestingly, blood lactates were low despite the large number of high intensity running bouts, suggesting that a majority of the anaerobic ATP resynthesis was provided by creatine phosphate breakdown.

KEY WORDS Heart rate, blood lactate, high-intensity running, sprinting, sideways running

O-126 Five-factor model of personality and psychological health of differently identified soccer fans

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OBJECTIVES Social scientist has recently become interested in the relationship between psychological health of sport fans and their identification with the team they supported. Despite the fact that sport fandom is often associated with fanaticism, negative behaviours and aggressiveness; social scientists believe that sport team identification is positively correlated with psychological health. This study was designed to ascertain the relationship among soccer team identification and five faces of the personality of individuals. By examining personality, psychological health of the soccer fans would also be examined in this study.

METHODS 218 male, 238 female university students participated in this study. To assess the level of team identification, Wann's Sport Spectator Identification Scale (SSIS) was used, whilst, personality of the sport fans was examined by shortened Turkish version of the NEO PI-R. Descriptive statistics, correlation analyses and one way ANOVA was conducted to analyze the data.

RESULTS Results of the one way ANOVA analyses indicated that highly identified fans' openness level was significantly higher than the medium level fans $F(2\text{-}449) = 5{,}08$, $p = .007$. The ANOVA was also significant in neuroticism, $F(2\text{-}449) = 4.27$, $p = .015$. Correlation analyses also indicated significant correlation between team ID and Extraversion, and negative correlation between team ID and Neuroticism.

DISCUSSION High scores on extraversion and low scores on neuroticism are strong indicators of psychological well-being (Wann et al, 2004). Results of the analyses showed that highly identified soccer fans had both higher scores on extraversion and lower scores on neuroticism than the lowly identified soccer fans indicating that highly ID fans were psychologically healthier than the lowly ID soccer fans.

Team ID / Personality	Low ID (N = 102)		Medium ID(N = 174)		High ID (N = 176)		DF			
	M	(SD)	M	(SD)	M	(SD)	(B-W)	F	Sig.	Sig. Diff
Extraversion	3,40	(,62)	3,46	(,67)	3,56	(,60)	2-449	2,25	,107	
Agreeableness	3,79	(,53)	3,80	(,46)	3,84	(,49)	2-449	,62	,536	
Conscientiousness	3,38	(,61)	3,41	(,62)	3,46	(,56)	2-449	,56	,57	
Neuroticism	3,05	(,63)	3,05	(,68)	2,87	(,67)	2-449	4,27	,015*	M > H
Openness	3,79	(,52)	3,63	(,56)	3,81	(,53)	2-449	5,08	,007*	H > M

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KEY WORDS Soccer, sport fandom, psychological health, personality, and team identification.