

Monitoring the Training Process in Women's Soccer (Football)

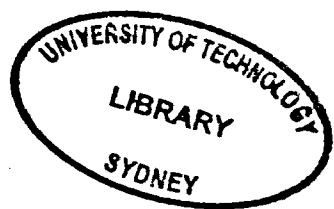
Thesis submitted for the degree of Master of Arts in Sport Studies (Research)

to

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Faculty of Business

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CERTIFICATE OF AUTHORSHIP/ORIGINALITY

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Abstract

The basis of the present thesis was to assess the validity and reliability of practical monitoring and testing tools that could be used by coaches, sport scientists and players to assist with the development and delivery of individualised training and periodisation programs, with the aim of achieving optimal performance. The aim of this research was to determine the utility of the session-RPE as a tool for monitoring training load (TL) in women's soccer and establish the efficacy of a submaximal Yo-Yo intermittent recovery test to assess aerobic training adaptations.

A major problem for coaches is being able to implement training programs that simultaneously meet the physical and technical/ tactical objectives of both the team and individuals within the team. Therefore, to overcome the limitations associated with team-based training, it has been suggested that a simple system which monitors an individual's training load (TL), and their response to their individual stimulus is required. Furthermore it is possible that if a valid and reliable test that was sensitive to changes in aerobic fitness adaptations was developed and then combined with measures of internal TL, an individual player's response to training could be monitored and the training process improved.

The purpose of the first study was to examine whether the session-RPE method for quantifying internal TL is a valid tool that can be used in women soccer players. The session-RPE, heart rate and session duration were recorded for individual

training sessions and matches over a period of 16 weeks. Session-RPE was then validated by correlation analysis with three commonly used HR-based methods for assessing TL.

The second study examined whether measurements of blood lactate, RPE and HR responses to the 6 min submaximal Yo-Yo intermittent recovery test Level 1 (Yo-Yo_{submax}) are repeatable and valid methods of monitoring aerobic adaptations in women soccer players. Ten elite players completed the following laboratory and field tests: maximal oxygen uptake ($\dot{V}O_{2max}$), lactate threshold velocity (LTV), Multistage Fitness Test (MSFT) and Yo-Yo_{submax}. The test-retest reliability of a 6 min Yo-Yo_{submax} was completed by fourteen elite women players.

The third study assessed the sensitivity of physiological and perceptual responses following the 6 min Yo-Yo_{submax} test to markers of aerobic fitness. Nine elite women soccer players completed the MSFT before and after a 14 week early season soccer program. In addition, the players completed a Yo-Yo_{submax} test every four to five weeks during this period. The amount of change (Δ) in the blood lactate concentration [BLa⁻], heart rate (HR) and rate of perceived exertion (RPE) responses from the Yo-Yo_{submax} test from the pre to post test occasions were correlated with the amount of change (Δ) in blood lactate, HR and RPE response from maximal field and laboratory-based treadmill tests. Furthermore, the same variables were correlated with training loads (TL) recorded over the 14 weeks.

The main finding in the first study was that the session-RPE method for monitoring TL was valid in women soccer players. Significant correlations were observed

across all training types and in particularly aerobic-based training sessions of a less-intermittent nature. In study two and three the validity, sensitivity and repeatability of a submaximal Yo-Yo intermittent recovery test was assessed for use with women soccer players. We found that the test had a moderate level of repeatability and that the physiological variables taken following the Yo-Yo_{submax} related to Multi-Stage Fitness Test (MSFT) performance but not to Lactate Threshold Velocity (LTV). The Yo-Yo_{submax} proved not to be a sensitive tool in assessing changes in aerobic capacity in elite women soccer players. Furthermore we found no correlation between Yo-Yo_{submax} variables and TL.

In conclusion, the results of the present studies suggest session-RPE may be a valid method for assessing internal TL for soccer players. Furthermore, Yo-Yo_{submax} may be a viable method for assessing aerobic capacities in soccer players. However, it is recommended that when this test is used to monitor soccer players, results are interpreted according to the test-retest coefficient of variation result provided in this study.

Keywords

Aerobic fitness

Blood lactate

Heart rate

Internal training load

Periodisation

Soccer training

Submaximal fitness test

Rating of Perceived Exertion

List of Abbreviations

1RM	One repetition max
[BLa]:RPE	Ratio of blood lactate to rating of perception of effort
CR 10	Category ratio scale
HR	Heart rate
HRmax	Maximal heart rate
HR:RPE	Ratio of heart rate to rating of perceived exertion
HR:[BLa]	Ratio of heart rate to blood lactate
LT	Lactate threshold
LTV	Lactate threshold velocity
LT _{zone}	Lactate threshold zone
LIST	Loughborough Intermittent Shuttle Test
MSFT	Multistage fitness test
OBLA	Onset of blood lactate accumulation
RPE	Rating of Perceived Exertion
TL	Training Load
TRIMP	Training Impulse
$\dot{V}O_{2max}$	Maximal oxygen consumption
Yo-Yo IR1	Yo-Yo intermittent recovery test level 1
Yo-Yo _{submax}	6min Yo-Yo intermittent recovery test level 1