



澳門大學

UNIVERSIDADE DE MACAU

教育學院

Faculty of Education

體育教學及運動碩士學位課程

Master's Degree Programmes of Physical Education and Sport Studies

YO-YO跑和持續跑對中學生籃球運動員有氧耐力的實驗研究

An Experimental Study of Yo-Yo and Continuous Endurance

Running on Aerobic Capacity in Athletes of Secondary School

Basketball Team

學生姓名： 黃康旭

Student: Wong Hong Iok

指導教師： 孔兆偉

Supervisor: Dr. Kong Zhao Wei

二零一一年四月

YO-YO跑和持續跑對中學生籃球運動員有氧耐力的實驗研究

中文摘要

本研究以準實驗法實施，目的在於探討 10 週的耐力訓練對青少年男籃運動員有氧耐力的影響，以及比較 Yo-Yo 間歇耐力訓練與持續耐力跑訓練對提升有氧耐力的優劣。研究對象為澳門某學校校隊的 26 名青少年男籃運動員，身體健康、志願參加是項研究，平均年齡為 14.96 ± 1.56 歲，籃球訓練史為 2.31 ± 1.23 年。受試者隨機等分為實驗組 (Yo-Yo 間歇耐力訓練組) 和對照組 (持續耐力跑訓練組)，Yo-Yo 組進行為期 10 週、每週 3 次的 3 次 Yo-Yo 間歇耐力跑訓練；持續跑組進行為期 10 週、每週 3 次的耐力跑訓練，持續跑前 3 週每次訓練為 5 分鐘跑步，隨後跑步時間提升到 7 分鐘；在每次耐力訓練時，兩組受試者均需報告主觀疲勞感覺 (RPE)，同時分別隨機抽取 5 位同學佩戴 polar 錶記錄運動中的心率。在實驗前後，比較 Yo-Yo 組和持續跑組之 12 分鐘跑、Yo-Yo 間歇耐力跑測試成績、及功率車漸增負荷測試預測的最大攝氧量。結果發現：1) Yo-Yo 組和長跑兩種訓練方法均能顯著提高運動員的 12 分鐘跑 ($F = 39.787$, $p < 0.001$) 和 Yo-Yo 間歇耐力成績 ($F = 41.363$, $p < 0.001$)，兩組之功率車漸增負荷測試預測的最大攝氧量無顯著提升 ($p > 0.05$)。Yo-Yo 組之 12 分鐘跑從 2244.62 ± 294.14 米提升至 2624.62 ± 500.23 米，持續跑組從 2338.69 ± 289.91 米提升至 2639.23 ± 229.58 米；Yo-Yo 組之 Yo-Yo 間歇耐力跑測試成績從實驗前的 1049.23 ± 385.45 米提升至 1707.69 ± 453.54 米，持續跑組從 1018.46 ± 430.38 米提升至 1544.62 ± 434.98 米。2) 不同位置的運動員的 12 分鐘跑和 Yo-Yo 間歇耐力成績均有顯著性提高，12 分鐘跑提高幅度在 3.79% - 18.57%，Yo-Yo 間歇耐力成績提高幅度在 39.02% - 63.87%，前鋒提高的最多，中鋒提高的最少。結果顯示：10 週的 Yo-Yo 間歇耐力訓練及持續跑耐力訓練均能提升中學生籃球校隊運動員的有氧耐力；較低的運動量的 Yo-Yo 間歇耐力訓練能達到較高運動量的持續跑的有氧耐力訓練效果，提示 Yo-Yo 間歇耐力訓練比持續跑具有更加的有氧耐力效果。

關鍵字：中學、籃球運動員、Yo-Yo 間歇耐力訓練、持續耐力跑、有氧耐力

An Experimental Study of Yo-Yo and Continuous Endurance Running on Aerobic Capacity in Athletes of Secondary School Basketball Team

The purpose of this study, using quasi-experimental method, was to examine the effects of 10 weeks endurance training on young basketball players' aerobic endurance, and to compare the difference of Yo-Yo Intermittent Endurance Training and Continuous Endurance Running Training on aerobic endurance.

26 healthy male volunteers from a school basketball team participated in this study (age 14.96 ± 1.56 years, basketball training history 2.31 ± 1.23 years). Subjects were randomly divided into Yo-Yo intermittent endurance training (Yo-Yo group) or continuous endurance running training group (CON group). All subjects took these two training programs of 3 times a week for 10 weeks. For CON group, the time of continuous running was 5 minutes in the first 3 weeks and 7 minutes in the later 7 weeks. In each training bout, all subjects were required to report Ratings of Perceived Exertion (RPE), while five students in each group were randomly selected to be monitored of heart rate. Before and after the endurance training program, 12 minute run, Yo-Yo test and maximum oxygen uptake predicted by incremental cycle ergometer test were investigated.

The results showed that: 1) both training programs can significantly improve the performances of 12-minute run ($F = 39.787, p < 0.001$) and Yo-Yo Intermittent Endurance Test ($F = 41.363, p < 0.001$), while the maximal oxygen uptake had no significant changes ($p > 0.05$). The results of 12-minute run in Yo-Yo group rose from 2244.62 ± 294.14 m to 2624.62 ± 500.23 m, and for endurance running group, from 2338.69 ± 289.91 m to 2639.23 ± 229.58 m. The performances of Yo-Yo test were changed from 1049.23 ± 385.45 m to 1707.69 ± 453.54 m in Yo-Yo group and 1018.46 ± 430.38 m to 1544.62 ± 434.98 m in continuous endurance running group respectively. 2) different position players had significant increase in the results of 12-minute run (3.79% - 18.57%) and Yo-Yo test (39.02% - 63.87%). Strikers improved the most, while center forwards had the least improvement.

The findings of this study indicated that both 10 weeks of Yo-Yo intermittent endurance training and continuous endurance training enhanced the endurance in athletes of secondary school basketball team and small work load of Yo-Yo Intermittent Endurance Training can achieve the effect of large work load of continuous endurance running. It suggests, for improving aerobic capacity, the effect of Yo-Yo intermittent endurance training is better than continuous endurance running.

Key words: Secondary School, Basketball Players, Yo-Yo Intermittent Endurance Training, Continuous Endurance Running, Aerobic Capacity.

內容目錄

第壹章 緒論	1
第一節 研究背景與動機.....	1
第二節 研究目的.....	3
第三節 研究問題.....	3
第四節 研究假設.....	3
第五節 名詞操作性定義.....	4
第六節 研究範圍與限制.....	5
第二章 文獻探討	6
第一節 籃球技戰術特點對運動員體能的要求.....	6
第二節 體能訓練的內容與提升有氧耐力的方法.....	8
第三節 Yo-Yo間歇耐力訓練的發展與應用.....	15
第四節 澳門學校籃球運動員耐力訓練狀況.....	18
第五節 文獻總結.....	20
第三章 研究方法	21
第一節 研究架構與流程.....	21
第二節 研究對象.....	23
第三節 訓練安排.....	24
第四節 測量工具與實施方法.....	24
第五節 資料處理與統計分析.....	25
第四章 研究結果與討論	27
第一節 澳門中學生籃球運動員基本有氧耐力狀況.....	27
第二節 10 週訓練對籃球運動員有氧耐力的影響.....	28
第三節 耐力訓練過程中有氧耐力變化狀況.....	31
第四節 小結.....	35
第五章 結論與建議	36
第一節 結論.....	36
第二節 建議.....	36
參考文獻	37
一、中文文獻.....	37
二、英文文獻.....	41
附錄一 測試記錄表	42
附錄二 測試與訓練圖片	47