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Effect of sports specific endurance circuit training on sprinting performance and leg explosive power of high school male basketball players during competitive

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ABSTRACT

The purpose of the study was to evaluate the effectiveness of a basketball specific endurance circuit training on sprinting performance and leg explosive power on high school male basketball players during competitive season. A total of twenty four (24) male high school basketball players were selected from Neyveli Lignite Corporation Sports School, Neyveli and St. Joseph Higher Secondary School, Manjakuppam, Cuddalore. These subjects were randomly distributed into two groups namely sports specific endurance circuit training group (N=12) and control group (N=12). The sprinting performance and leg explosive power was selected as dependent variables. The sprinting performance was measured through 30 meters dash and leg explosive power was measured through vertical jump test. The result of the study showed that sprinting performance (t = 4.187, p = 0.002) and leg explosive power (t = 2.345, p = 0.039) improved significantly in sports specific endurance circuit training group. However, control group showed no changes in sprinting performance and leg explosive power. It is concluded that sports specific endurance circuit training group significantly improved sprinting performance and leg explosive power of adolescent male basketball players during competitive season.

KEYWORDS : Swami Vivekananda, J.S.Mill, Liberty, Society, Women, Hinduism

Introduction

Just over a century ago in Springfield, Massachusetts, a physical education instructor named *Dr. James Naismith* was looking for a game that could be played in indoors during cold winter months. He fastened two peach baskets to the gymnasium balcony and instructed students to throw a soccer ball into the baskets. This is how the game basketball was born. Initially there were no backboards, dribbling and seven persons played on a team. During the game a person had to sit on a ladder to pull the ball out of the basket and toss it back down to the players. Gradually changes and refinements were made until the game evolved into the one which played today.

Basketball is an aerobic-based anaerobic sport (Delextrat and Cohen, 2009) which requires high intensity activities such as jumping (for rebounds, blocks and shots), turns, dribbles, sprints, screens and low intensity activities such as walking, stopping and jogging. Frequent stoppages in games allow players to recover between bouts of activity, thus allowing repeated high-intensity spells of play (Drinkwater, 2008). Explosive strength, take-off power, speed, and agility are abilities that make an important contribution to efficient movement with and without the ball, thus play an important role in basketball technique and tactics. The importance of developing good conditioning programs based on the specific physiological demands of each sport is considered a key factor to success (Gillam, 1985; Taylor, 2003; 2004). Basketball requires tremendous endurance, speed, agility, and power (Siegler, *et al*., 2003). The focus of training for many years has been to enhance performance and gain advantages over other competitors. The purpose of the study was to evaluate the effectiveness of a basketball specific endurance circuit training on sprinting performance and leg explosive power on high school male basketball players during competitive season.

Methodology

Subjects

A total of twenty four (24) male high school basketball players were selected from Neyveli Lignite Corporation Sports School, Neyveli and St. Joseph Higher Secondary School, Manjakuppam, Cuddalore. These subjects were randomly distributed into two groups namely sports specific endurance circuit training group (N=12) and control group (N=12). The mean age of the selected players was 16.85 ± 0.67. The selected players had 3.8 ± 3.1 years of playing experience and regularly participate in training prior to the commencement of this study. All subjects were subjected to medical examination by a general medical practitioner before participation in the study to ensure that there was of sufficient standard to be able to take part in fitness testing and training.

Variables

The sprinting performance and leg explosive power was selected as dependent variables. The sprinting performance was measured through 30 meters dash and leg explosive power was measured through vertical jump test. The independent variable selected in the present study was sports specific endurance circuit training for 6 weeks. The sports specific endurance circuit training group underwent sports specific endurance circuit training and CG underwent regular basketball training.

Statistical technique

The collected data was evaluated using paired *t test*. The proposed hypothesis was tested at 0.05 level of confidence. Beside this mean and standard deviation were also calculated. SPSS statistic software package (SPSS, version 17.0) was used. The α value of 0.05 was set for statistical significance.

Results

The result of the study showed that sprinting performance ($t = 4.187$, $p = 0.002$) and leg explosive power ($t = 2.345$, $p = 0.039$) improved significantly in sports specific endurance circuit training group. However, control group showed no changes in sprinting performance ($t = 0.635$, $p = 0.654$) and leg explosive power ($t = 0.557$, $p = 0.589$).

Discussion

In the present study sprinting performance and leg explosive power of sports specific endurance circuit training group improved significantly. Previous research suggests that aerobic endurance training can interfere with the development of strength and this could potentially limit improvements in speed and explosive power (Bentley, Zhou and Davis, 1998; Dudley and Djamil, 1985; Glowacki *et al*., 2004). In the present study sports specific endurance circuit training did not affect power related performance. This observation of no interference and improvement effects parallel the results of similar aerobic endurance training studies involving in soccer players (Helgerud, *et al*., 2001; McMillan, *et al*., 2005).

Conclusion

It is concluded that sports specific endurance circuit training group significantly improved sprinting performance and leg explosive power of adolescent male basketball players during competitive season.

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