

Effect of plyometric training in children and adolescence athletics. : A current concept review.

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Abstract : Plyometric training is an effective training method for sports fitness. The aim of this current concept review is to understand the effectiveness and current trend of plyometric exercises for children and adolescent athletes.

Keywords – Plyometric training, Athletes, Children, Adolescent, Sports Training.

INTRODUCTION

Plyometric training is high velocity resistance training which is characterized by a rapid eccentric contraction leading to muscle elongation, followed immediately by a rapid reversal of movement during which a resisted shortening contraction of the same muscle takes place. It is also named as stretch shortening cycle (SSC) because the rapid eccentric loading phase is the stretch cycle and the concentric phase is the shortening cycle. The time period between the stretch and shortening cycle is known as the amortization phase, which is known to be very brief due to rapid reversal of movements to capitalize on the increased tension in the muscle. This process helps the muscle to generate tension in the shortest time possible¹.

The series of events involved in plyometric exercises involve– elastic & stretch reflex properties of the neuromuscular unit. The stretch shortening cycle stimulates the proprioceptors of muscles, tendons, ligaments & joints, increases the excitability of the neuromuscular receptors, and improves the reactivity of the neuromuscular system. This is the reason term reactive neuromuscular training is used to describe these kind of exercises¹.

The three distinct phases of the plyometric activities are 1. eccentric phase, 2. Amortization phase and 3. Concentric phase.

1. Eccentric phase : The eccentric phase occurs when the muscle is prestretched as it actively lengthens. The elastic components of muscle are put in stretch after taking out the slack. This is the preparatory phase which sets the muscle as the individual gets ready to perform the activity .
2. Amortization phase : The eccentric phase is followed immediately by the amortization phase. Its the amount of time it takes to move from eccentric to concentric motion. A prolonged amortization phase also inhibits the stretch reflex. It is also known as the transition phase. The force of movement depends upon how quickly the transition from eccentric to concentric activity takes place.
3. Concentric phase : The final phase is the result of the combined eccentric and amortization phases. This is the outcome phase. The concentric phase produces the desired powerful movement If the eccentric activity was quick and the amortization occurred rapidly².

Its well known established training method that improves the muscle-tendon unit's ability to tolerate stretch loads and the efficiency of the stretch-shorten cycle shorten cycle (ssc)³. Muscle strength, endurance as well as flexibility of the muscle are important factors to be worked on before starting a a plyometric training¹. Intensity , volume , recovery and frequency are various variables that define plyometric exercise progression².

The objective of this review paper is to provide a short update of existing evidence on effect of plyometric training on children and adolescents.

In this study we explored the relevant research articles from the Pubmed, Cochrane library, Pedro and Google Scholar from 01.01. 2017 to 4.10 2018 for effect of plyometric training on children and adolescent

Effect of plyometric training

A) On Jumping performance ,agility, sprinting (2.2018)

Ozmen & Aydogmus⁴ conducted a randomized controlled trial (RCT) to investigate the effect of plyometric training on jumping performance and agility in adolescent badminton players.

Twenty players including nine boys and eleven girls were randomly assigned into plyometric training (PG) and control group (CG group).Only the participants of plyometric training group received the 6 weeks plyometric training in addition normal exercise program that continued for both of the groups.

Results showed that a six week plyometric training improved agility and vertical jump in adolescent badminton players.

B. On physical fitness

Campillo et al⁵ included Seventy-six male soccer players in their RCT to compared the effects of plyometric jump training (PJT) on measures of physical fitness .Players are randomly divided into PJT group or a control group. Only PJT group or experimental group received PJT program for 7 weeks . PJT group showed significant improvement in various component of physical fitness than the control group.

Silva et al⁶ conducted a RCT with twenty female Futsal athletes to examine the effects of four weeks plyometric training (PM) on muscle power output, flexibility and body composition.

In addition to routine training the only experimental group received PM.

Results of the study were in favor of good effects of plyometric training on reducing body fat and increasing flexibility and muscle power in female Futsal athletes.

Discussion

Any sport demands a good amount of physical fitness. Mostly studies in this review performed plyometric exercise for 4 weeks to 7 weeks. In this review we found that plyometric exercises have an important role in increase ability Jumping performance, agility, sprinting, balance in children as well as adolescent athletes irrespective of any sports .

Conclusion

There ere are several limitation of our study i;e search strategy, Inclusion criteria, since we are trying to understand the effect and current trend of plyometric exercise in children and adolescents , we found that Plyometric training may have potential positive effect in component of physical fitness for children and adolescence athletes .

Conflict of Interest

Non declared

References.

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6. Silva et al Effects of short-term plyometric training on physical fitness parameters in female futsal athletes