https://doi.org/10.35219/efms.2023.1.12

CONSIDERATIONS FOR STRENGTH TRAINING IN CHILDREN

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Abstract: *The aim of the study was to determine the advantages and the disadvantages of the strength training for children. It's important to know, what the effects are, of this type of training program, on the preadolescents and adolescents.*
Rumors and misinformation have helped persuade many to disapprove of preadolescent strength training. This is changing, however, as new knowledge replaces old misconceptions.
Finally, we can concluded, that the children strength training program is efficient and without risks, if it is conducted with proper supervision after the principles of gradually loading.

Key Words: Children, Excercises, Strenght Training, Training Program

INTRODUCTION

The effectiveness, benefits, and possible risks associated with strength training in children have attracted wide interest from researchers, coaches, and even young athletes and their parents. Strength training at an early age can have negative repercussions on the growing body, but we make the assumption that a strength training program developed according to scientific methods and rationally conducted can lead to spectacular results.

The purpose of this paper is to pay attention to some relatively recent studies, studies that highlight the benefits of strength training for children and remove some old concepts that generate disputes.

More and more children are trained after strength training programs. By the term strength training (strength training) Tanner (1993) refers to the use of one's own body weight, dumbbells, dumbbells, or machines to improve muscle strength and implicitly

athletic performance. The key to strength training, both for children and adults, is the principle of progressive weights.

Schafer (1991) understands by the term child subjects boys or girls at prepubertal age, prepuberty being the period between late childhood and the onset of secondary sexual characteristics.

Following an analysis of 28 studies on the effectiveness of resistance training in children, Falk & Tenenbaum (1996) concluded that resistance training can be effective in prepubertal subjects.

Significant improvements in strength were recorded in 25 of the 28 studies, with degrees of improvement ranging between 13 and 30%. Pfeiffer and Francis (1986) studied the effects of 9 weeks of isotonic resistance training on isokinetic strength in groups of prepubertal, pubertal and adolescent boys. The prepubertal group showed a greater percentage increase in 11 out of 16 strength-specific parameters that were measured, compared to the pubertal and adolescent groups.

Nielsen et al. (1980), studied the effects of three types of training on groups of girls aged between 7 and 19 years. The girls were divided into groups according to their height.

The trained groups performed isometric strength training (24 knee extensions per training session), running (distance of 100 steps) in 10 starts, and vertical jumps (80 jumps per training session).

Only the isometric trained group had a significant increase in voluntary isometric knee extension strength compared to the control groups and only the jump trained group improved their vertical jump performance.

And other studies by Rians et al. (1987), Duba (1986), Schafer (1991), Faigenbaum (1993), Blimkie (1992), Ozmun et al. (1993), Metcalf and Roberts (1993), Tanner (1993) confirms the hypothesis that strength training is effective and beneficial for children.

In making the decision to use strength training as a training method for prepubertals, we must first understand that a child's body is very different from an adult's body, and that a child is not a miniature adult.

Children have systems that are developing and therefore more exposed to the risk of accidents. One of these components is the skeletal system, because the children's bones are not matured, the ossification processes being in full swing, they are exposed to a large number of accidents and disorders both physical (fractures, vertebral dislocations, osteoporosis) and chemical (decrease in the amount of mineral salts in the composition of each bone).

However, several studies (Servedio et al., 1985; Sewall & Micheli, 1986; Weltman et al., 1986) have demonstrated that young boys and girls can improve their muscle strength at approximately the same rate as adults.

In a study carried out by Westcott (1991) on 14 subjects boys and girls with an average age of 14 years, who had as a control group 5 subjects of the same age, training was carried out for 8 weeks three days a week, in which the experimental group followed a strength program on the following machines: leg extension, leg curl, leg press, incline press, low bench, press down and pulldown.

Participants performed 8-12 repetitions of each exercise using both slow and fast movements.

The results showed an increase in the strength of the lower body region in the experimental group by 63% and by 33% in the strength of the upper region. Compared to the control group, an 8% increase in strength was recorded in the experimental group in the lower part and 4% in the upper part.

Both groups recorded a 3-pound increase in body weight over the 8-week experiment. The experimental group recorded an increase in the weight of lean mass of 1.816 kg and a decrease in the weight of fat mass of 0.45 kg., while in the control group there was an increase of 0.9 kg pound in the weight of lean mass and 1 pound in fat weight. Although the control group experienced a 0.9kg increase in lean tissue weight through normal growth processes, they did not have a significant increase in functional muscle strength

The experimental group recorded a two-fold increase in lean mass and a significant improvement in functional muscle strength.

During this study, the authors did not report any injuries in the two groups, both in boys and in girls.

Another study also carried out by Westcott (1992), involves 10 preadolescent boys and girls with an average age of 10 years. All subjects participating in this study trained three days a week for 8 weeks following a strength training program on the following machines: leg extensors, leg curls, bench press, biceps curl, and shoulder press. The subjects performed a series of 8-10 repetitions for each exercise, with slow and wide movements.

The results obtained at the final testing show a 66% increase in the strength of the pectoral triceps, and also recorded an improvement of 1.8kg in body weight by adding 1.3kg of lean tissue and losing 0.454kg of fat tissue.

Also, during this study, the author did not report any injuries.

A larger study by Westcott (1993) included 57 prepubertal boys and girls with an average age of 11 years. All subjects trained three days a week for 8 weeks following a strength training program on the following machines: leg press, compound row, bench press, torso-arm and rotary torso. They performed a series of 8-12 repetitions for each exercise using slow and wide movements.

The obtained results show that these exercises increased the strength of the pectoral triceps by 55%, achieving a 2.9kg increase in body composition by adding 1.8kg of lean tissue and removing 1.1kg of fat mass.

A study conducted by Faigenbaum, Zaichkowsky, Westcott, Micheli, and Fehlandt, (1993), involved two groups of preadolescent boys and girls.

The experimental group included 14 subjects with an average age of 11 years, and the control group included 9 subjects with an average age of 10 years.

Unlike the studies above, in this study, two training sessions per week for 8 weeks were performed on the following machines: leg extenders, leg curl, biceps curl, and shoulder press. The participants performed 3 series between 10 and 15 repetitions for each exercise.

The obtained results indicate that the experimental group recorded an increase in the strength of the pectoral triceps muscle by 64% and the total strength by 74%.

Changes in body composition were measured by measuring skinfolds. The experimental group recorded a 2% decrease in fold measurements, compared to a 2% increase in the control group.

This method resulted in an improvement in both muscle strength and body composition in the experimental group compared to the control group.

DISCUSSION

All four studies above show significant improvements in strength in children aged 10 to 14 years following strength training for 8 weeks.

It should be emphasized that the improvement in triceps pectoral muscle strength is similar both in the studies in which repetitions were performed in one set for each exercise three times per week and in the study in which three sets were performed in each exercise twice a week.

These aspects allow us to say that to develop strength in children, 1-3 sets for each exercise two or three times a week are sufficient.

However, exercises that involve lifting maximum weights should be avoided, due to the high risk of injury to an epiphysis, also called "growth plateau", which is very vulnerable at this stage of development (prepubertal). Damage to this "plateau" results in stunted growth. (Fleck and Kraemer, 1993)

According to Payne, Morrow, Johnson, and Dalton (1997), resistance training increases muscle strength and endurance in children, and Guy and Micheli (2000) are of the opinion that improvements in strength values in children in the prepubertal development phase they are the result of neuro-muscular activations and coordination supporting the evidence that androgens (hormones largely responsible for increasing strength and muscle mass) do not need strength increases.

Fleck and Kraemer (1993), in "The American Academy of Pediatrics", state that body weight resistance exercises are a good starting point for most children under 8 years of age, or for any child beginning a training program. by force. The purpose of this type of training is to introduce the body to the stress of strength training and to learn the basics of movement technique.

CONCLUSIONS

Finally, we can conclude that strength training for children is both beneficial and effective, as long as it is performed according to the principle of gradual weighting and under strict supervision by the trainer.

The number of sets and repetitions for each strength exercise should be between 2-3 sets of 10-15 repetitions two to three times a week, an increase in the number of strength training sessions per week and the number of sets and repetitions for each exercise will not result in faster strength improvement.

Strength training in children also results in an improvement in body composition and an average 1.3-1.8kg increase in lean mass and a loss of 0.4-1.1kg in fat mass.

But most importantly, no injuries were reported during the studies, suggesting that a well-designed and well-supervised strength training program is safe and effective for both improving muscle strength and body composition in adolescent and pre-adolescent children, both boys and girls.

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