

Youth Resistance Training: An Alternative Means to Physical Activity

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Considering the decline of physical activity and the rise in obesity in today's youth, it is essential to expose this population to a variety of methods to enhance compliance to physical activity. Less than one in three youth are physically active on a regular basis. Obesity rates have almost doubled in children and quadrupled in adolescents over the last 30 years. While sports and aerobic exercise are excellent means to address these issues, they may not be ideal for everyone. Some youth may lack skills necessary for success in sports or may have difficulty participating in aerobic exercise due to excess body weight. This may ultimately contribute to avoidance in these types of activities. Resistance training may provide a more positive experience for youth, which can lead to lifelong fitness. While aerobic training should always be promoted, resistance training should not be overlooked. It may improve the ability for youth to achieve the recommended 60 minutes of moderate to vigorous activity on most days.

Safety of Resistance Training in Youth

The American College of Sports Medicine, the National Strength and Conditioning Association, and the American Academy of Pediatrics suggest resistance training can be integrated as a part of youth physical activity programs assuming proper technique and supervision are applied.

Research suggests the risk of injury during resistance training may be more related to poor exercise technique and improper use of equipment than the activity itself. Many of the reported injuries related to resistance training are due to incorrect technique, lack of proper supervision, excessive loads, and inappropriate use of exercise equipment. Very little evidence is available to indicate that properly supervised and planned resistance training programs cause an increased risk of injury. Research indicates that proper resistance training programs are safer than many youth sporting programs.

An original concern of resistance training in youth is excessive stress and potential damage to growth plates, the tendon bone juncture, and the cartilage covering the ends of bone. These areas are more sensitive and susceptible to damage in younger populations when excessive stresses are placed on them; however, no research has demonstrated that properly prescribed resistance training has or can damage growth plates. No evidence suggests resistance training has a negative impact on linear growth. Muscle strains are common in those participating in heavy resistance training; however, many of these injuries are due to excessive resistance or improper form. Properly

prescribed resistance training may reduce the risk of muscle strain injuries.

Benefits of Youth Resistance Training Programs

It is important to recognize that youth should first be encouraged to obtain physical activity through "play". However, health benefits have been confirmed when resistance training is incorporated into youth physical activity programs.

Resistance training has been shown to improve body composition and improve insulin sensitivity. While more research is needed, some studies indicate the potential to lower blood pressure in youth with hypertension and improve lipid profile. Resistance training enhances bone remodeling due to the applied compressive and tensile forces, which increases bone strength. Depending on program design, improvements in motor performance skills such as speed and jumping ability have been demonstrated. Properly prescribed programs have the potential to increase resistance to sports related injuries.

Of all the potential benefits of resistance training, one area that may be of most value is the enhanced psychosocial well-being. Not all studies, but some demonstrate positive improvements in self-efficacy. This is one of the most important predictors of success and continued life-long participation in exercise programs. Research has suggested the psychosocial benefit developed through resistance training may be similar to that seen in team sports.

Obese youth may have difficulty with the continuous nature of aerobic exercise due to excess body weight. Resistance training offers shorter bouts of exercise interspersed with rest or recovery breaks. These short breaks may improve compliance, reduce overuse injuries, and improve the enjoyment of the activity. For this population, compliance to resistance training is higher compared to aerobic training.

Guidelines for Proper Youth Resistance Training Programs

The first priority when designing resistance training programs is to focus on developing appropriate guidelines to ensure safety. This begins with establishing a qualified professional who has appropriate certifications or significant hands on experience working with youth. This individual will be in charge of maintaining equipment, facility design, and most importantly proper education. Youth must be taught proper weight room etiquette. This includes lifting with a partner who understands proper spotting techniques and using weight that is appropriate for their level of strength. There is no need to perform maximal lifts early in a training program. Proper breathing techniques should be incorporated into all lifts. Finally, the area that takes the most time and effort is enforcing proper lifting technique. Youth should demonstrate proper form prior to the addition of weight.

While competition within peers is a natural occurrence, it is important to avoid a competitive environment. The focus should be on individual achievements, rather than the comparison between participants. Positive reinforcement should be provided for demonstration of proper form rather than the amount of weight achieved. The goal is to promote lifelong fitness so programs should be fun for the participant.

Program Design

As with all exercise programs, proper warm up and cool down should be performed prior to and after resistance training. The warm up should include dynamic activities that enhance blood flow to the muscles to be trained without producing fatigue. These warm-up activities should mimic motions that occur in the training program. Static stretching is appropriate during the cool-down phase. Programs should follow a few simple guidelines. Youth should first learn simple before complex movements; use single before multiple joint lifts; use light resistance before progressing to higher resistance; use slow controlled movements before explosive movements; perform stable before unstable movements.

Exercise Prescription Should Follow the F.I.T.T. (Frequency, Intensity, Time, and Type) Principle

Beginners should use resistance between 50-70 percent of 1RM (one rep maximum) for 10-15 repetitions. One to two sets per muscle group should be used for all major muscles. As

youth progress to become advanced lifters, they can use 70-85 percent 1RM for 6-10 repetitions. Five sets per muscle group should be performed for all major muscles. Recovery intervals can vary in duration; however, because youth tend to recover faster than adults, a one-minute rest period is appropriate. This may be increased as the participant advances in the amount of weight and sets performed. Muscle repair may take between 48-72 hours and so training each body part twice per week is ideal for training adaptations and recovery. It is essential to also incorporate stabilization exercises that are often overlooked in resistance training programs. These include scapular stabilizing exercise, rotator cuff strengthening, and knee stability neuromuscular training. Agonist and antagonist muscle should be proportionally trained.

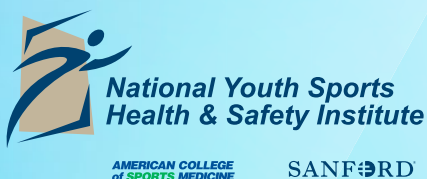
Speed of movement is essential for both safety and neuromuscular development. Early resistance training should focus on a one- to two-second concentric phase followed by a two- to three-second eccentric phase. All three types of muscle contractions should be emphasized during each repetition. As the participant advances their lifting skills, more explosive movements can be utilized. Variety in the lifting program is essential to maintain compliance and enhance enjoyment.

Neuromuscular adaptation to strength can occur relatively quickly as youth develop new movement patterns. Therefore, it is essential to pay attention to progression. As the participant is able to increase repetitions for each set beyond 15, it may be appropriate to increase resistance. A typical progression may employ 5-10 percent increments.

Finally, it is essential to create a support system that incorporates parents, coaches, and physical education teachers. Each support member should be educated on the role resistance training plays on the participant. A team approach improves the likelihood one will have a positive experience and encourage compliancy throughout life.

The Message

Youth resistance training programs are becoming increasingly popular in physical education classes, fitness facilities, and private training companies. Significant health benefits have been demonstrated with properly designed and supervised youth resistance training programs. For many youth, it provides an alternative means to participation in physical activity. Certain youth populations may find resistance training a more exciting and fun way of obtaining physical activity. The primary organizations that set standards for exercise programs all support youth participation in properly designed and supervised resistance programs.



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