Psychosocial Benefits of Prepubescent Strength Training

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Over the past decade, scientific papers (8, 18, 19, 20, 31) and review articles (2, 7, 12) have expounded the anatomical and physiological benefits of prepubescent strength training. Improvements in voluntary strength (8, 18, 20, 31), motor performance (31, 35), maximal oxygen uptake (31), body composition (8, 20), and blood lipid profiles (32) have been observed in prepubescents following various strength training programs. Moreover, the bone mineral density of junior competitive weightlifters has been reported to be greater than that of age-matched controls (3, 30), and similar findings have been noted in prepubescents who maintain high levels of physical activity (34).

However, we should not overlook the fact that there are potential psychosocial benefits to prepubescent strength training. As previously observed in adult populations (4, 5, 15, 17, 27, 29), a well-designed and appropriately supervised strength training program for prepubescents may have a positive influence on socialization skills, mental discipline, attitudes toward fitness, and self-concept.

This article briefly reviews the psychosocial benefits of adult strength training programs with a focus toward the potential psychosocial benefits of prepubescent strength training, and cites effective teaching strategies for enhancing the psychosocial wellbeing of children who participate in strength training programs.

By definition, prepubescence refers to the period of time when boys and girls have not yet developed secondary sex characteristics such as noticeable pubic hair, axillary hair, and, in girls, pronounced breast development (22). Girls and boys up to the ages of approximately 12 and 14, respectively, are generally considered prepubescent, although individual variations do occur (10).

Strength training refers to the use of progressive resistance to increase the ability of muscles to exert or resist force. This term must be distinguished from the sport of weightlifting in which individuals often train at high intensities, perhaps 90 to 100% of a one-repetition maximum, in an attempt to lift maximal amounts of weight in competition.

The term self-concept pertains to one’s perception or image of oneself, whereas the term self-esteem refers to one’s belief or inner conviction about one’s worth as a human being (13). Self-efficacy concerns one’s confidence about being able to perform a situation-specific task (14). Body cathexis refers to one’s feelings toward one’s body, or specific body part or bodily function (e.g., sleeping) (15).

Psychosocial Benefits of Strength Training for Adults

Although the physical benefits of aerobic exercise on adult populations have been documented and promulgated in the literature, several studies (4, 5, 15, 17, 26, 28) have reported that strength training may also have a positive influ-
ence on their mental health and well-being. Since there is very little related information on prepubescent populations, the evaluation of data on adults may shed light on the potential psychosocial benefits of strength training for children. However, the physical and psychological maturity of children must be considered when evaluating data from older populations.

Tucker observed that college-age men who weight trained for 16 weeks scored significantly higher than controls on various measures of self-concept (24) and self-esteem (26). Similarly, Melnick and Mookerjee (15) noted significantly higher values for self-esteem and body cathexis in college-age men and women who participated in 16 weeks of weight training as opposed to a control group that completed a physical education major theory course.

James et al. (11) reported significant positive changes in the self-concept of college-age men who participated in a one-semester weight training course, while Dishman and Getzman (4) observed increases in psychic vigor and physical self-esteem in men who participated in a 20-week strength training program.

In order to explore the relationship between weight training and psychological well-being, Tucker (23) evaluated the past weight training experiences of 113 college men. It was concluded that the more months, consecutive or otherwise, that subjects had trained with weights, the higher their global self-concept scores. Furthermore, Tucker (23) observed that those who had weight trained regularly were significantly more sociable, impulsive, and outgoing than those who had limited weight training experiences.

Tucker (27) attempted to identify which types of men gain the most in self-concept during a strength training program. Following the strength training program, he noted an inverse association between pretest measures of body cathexis, self-concept, and neuroticism on the one hand, and global self-concept change on the other. Thus, men who had a relatively poor body attitude when they began strength training tended to increase significantly more in self-concept as opposed to men who began their strength training with relatively high body satisfaction scores.

In a similar report (29), it was noted that men who began a 4-month strength training program with relatively low levels of strength gained significantly more in body satisfaction than men who already had relatively high levels of strength when they began strength training.

As Tucker noted, the improvement in self-concept following a strength training program may be due in part to the ability to continually increase the training resistance as one gains strength, which in turn will promote feelings of competence and achievement. Furthermore, the resulting increases in muscle size and definition in men are deemed highly desirable in our society and likely enhance their self-concept (25, 28).

Participation in a strength training program appears to be just as effective as aerobic exercise in reducing clinical depression in women (5) and female college students (21). Interestingly, Doyne et al. (5) observed that the statistically and clinically significant decreases in depression scores in women were not dependent on improved cardiovascular fitness, and therefore suggested that behavioral and cognitive mechanisms may be responsible.

In a similar study, Ossip-Klein et al. (17) noted that both aerobic and strength training exercises significantly improved the self-concept of women suffering from clinical depression. Any differences that did occur between the two exercise groups slightly favored the strength trained group. Likewise, Stein and Motta (21) reported that participation in a short-term strength training program was superior to swimming for enhancing the self-concept of college students.

Data from adult populations demonstrate that the effects of strength training extend beyond physiological measures to include improvements in mental health and well-being. However, since the strength training protocols were not defined in many of the reports, we can only speculate as to the type of strength training program (e.g., low volume or high volume) most likely to enhance psychosocial well-being.
Potential Psychosocial Benefits of Strength Training for Prepubescents

Although scientific studies on the psychosocial benefits of prepubescent strength training are virtually nonexistent, empirical data support the contention of the American Orthopaedic Society for Sports Medicine (1) and the National Strength and Conditioning Association (16) that a well-designed and properly supervised strength training program may have a positive influence on the psychosocial well-being of children.

Clinical observations from several studies (19, 31) have suggested that prepubescent strength training may result in various psychological and social benefits. Following 14 weeks of supervised strength training, Rians et al. (19) observed that the socialization, motor learning, and mental discipline exhibited by prepubescents were similar to those of children participating in team sports. In another report (31), parents of prepubescents who participated in a strength training program noted that their children were more attentive to their homework and other responsibilities in the hours immediately following the training session than on days they did not strength train.

In my own observations, I have noted that parents of prepubescents who strength trained reported that their children were more willing to take part in various sports and perform household chores throughout an 8-week strength training period. Although the psychosocial impact of the training program was not specifically measured, verbal and written comments from most of the parents suggested that the effects of the training program included improvements in self-efficacy and fitness awareness.

Westcott (33) reported that children's attitudes toward physical education, physical fitness, and lifelong exercise significantly improved following 7 weeks of conditioning that included strength, endurance, and flexibility exercises. And Holloway et al. (9) observed significant improvements in the self-efficacy and general self-esteem of untrained adolescent girls who participated in a 12-week strength training program.

Unlike some other sports and activities, strength training provides an opportunity for virtually all participants to be continually challenged and to feel good about their successes. Although requisite skills and talents are not necessary for participation, the principles of overload and progression should be followed if one wants to achieve continual gains. Thus as each child gets stronger, the training resistance should be increased in order to meet the enhanced capabilities of the stronger musculoskeletal system.

The potential psychosocial benefits of prepubescent strength training should not be ignored. Socialization skills, mental discipline, and self-concept may all improve following strength training, provided that the program is appropriately supervised and well designed.

Effective Teaching Strategies

In most strength training programs, children are introduced to proper training guidelines and are taught the correct technique on various exercises. Coaches and instructors often have the opportunity to educate them about the benefits of a healthy lifestyle, and in turn the children are exposed to new learning environments outside the classroom. Instructors should assess each child's willingness to participate in the program and explain the most basic concepts in language the child can understand.

But for the program to succeed, the coach or instructor must understand children and appreciate their uniqueness. They must understand that children need to have fun. An 8-year-old should not be expected to comprehend the intricacies of periodization.

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With proper guidance (7), children will perceive themselves as getting stronger; they may actually see themselves lifting more weight and be able to document these strength increases on workout logs. As with adult populations (24), the positive feedback young weight trainers receive from their instructors, parents, and peers may promote feelings of success and achievement. But unlike adults, prepubescents experience more difficulty in increasing muscle size—beyond normal growth and maturation—in response to strength training (18). Thus the psychosocial benefits of prepubescent strength training will not likely be related to muscle hypertrophy consequent to training, but rather to an increase in self-efficacy and self-concept following a strength training program.

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weight. But most 8-year-olds can be taught the proper form on a variety of multijoint lifts and can understand the potential benefits and risks associated with strength training.

In addition to increasing strength and other physical parameters, another goal of the program should be to educate children about their bodies and promote positive attitudes toward strength training, physical activity, and sport. Children should be encouraged to embrace self-improvement and feel good about their performances.

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The focus of each session should be on form and technique. Each child should be allowed to make self-corrections, experience success, and receive positive feedback from instructors and peers. Instructors must be sensitive to participants whose fitness level is low, and each class should be characterized by enthusiastic leadership. Verbal positive reinforcement ("good form"), an opportunity to demonstrate an exercise, or a tangible reward such as a T-shirt are some of the best ways to increase intrinsic motivation, providing that the rewards do not become excessive.

The interaction between the instructors and the children should be open, honest, and nonintimidating. Throughout the program, children should be encouraged to express their concerns and be assured that these will be addressed. Continual support from parents and friends should not be overlooked.

Even though the acute program variables—sets, load, order of exercise, choice of exercise, rest periods—form the core of any strength training program, it is important for the coach or instructor to have a well-developed teaching plan. Along with this, an understanding of the cognitive, affective, and psychomotor domains of learning will increase the likelihood of achieving physical and psychosocial gains. The cognitive domain refers to one's knowledge base, the affective domain focuses on one's values, and the psychomotor domain encompasses the ability to complete a given task.

The following questions (6) may help the coach or instructor focus on the various domains of learning:

- Does the child have a working knowledge of strength training and understand how to use the equipment?
- Does the child understand proper training guidelines and the concept of progression?
- Is there open communication between the instructor and the child?
- Does the child genuinely appreciate the potential benefits and risks associated with strength training?
- Is the child motivated to train?
- Is the child comfortable with his or her body?
- Does the child have the emotional maturity to participate in a strength training program?
- Has the child mastered introductory skills before progressing to advanced levels of training?

Teaching methods that follow appropriate training guidelines and focus on the three domains of learning seem more likely to lead to improvements in anatomical and physiological measures, which in turn may promote positive feelings of self-concept and self-efficacy in children.

**Summary**

In view of the increasing popularity of prepubescent strength training, it is important to recognize the potential physical and psychosocial benefits of this activity. Empirical data suggest that a well-designed and properly supervised strength training program may enhance the mental health and well-being of children. Coaches and instructors should appreciate the uniqueness of childhood and should have an understanding of the various domains of learning.

**References**


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