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CSE 300

109199094

Literature Review First Draft

Safety of Weight Training in Adolescents

Weight training has become a very popular way of increasing strength and sports performance in young athletes. However, it is very common to hear that weight training in youths is not safe for the development of the child. Often times people attribute stunted growth among other things to working out from a young age. Research surrounding this issue has been conducted fairly extensively for decades now among children who strength train for their particular sport and children who compete in strength sports like powerlifting and weightlifting. The current body of research paints a very different picture from what is commonly accepted as fact in many circles regarding younger children and strength training.

Powerlifting is a strength sport where individuals compete in the squat, bench press, and deadlift. A questionnaire in 1983 was administered with the intent of finding out the incidence of injury among adolescent powerlifters in the Michigan Teenage Powerlifting Championship (Brown, Kimball). The teen powerlifters were asked to describe their workouts and injuries accrued during training within a certain timespan. In a 17.1 month period with an average of 4.1 workouts a week and an average workout lasting 99.2 minutes, 18 of the 71 participants experienced 98 injuries. Unsurprisingly, the lower back was the area that experienced the greatest numbers of injuries (49). This

area also was reported to have more general pain associated with powerlifting. This is unsurprising because the squat and the deadlift are both movements that use the lower back musculature to a significant degree. It is also the area most likely to be injured as form begins to degrade due to fatigue. Particularly with the deadlift, form breakdown puts the lower back at significantly higher risk for injury if form is not maintained. While this research does not put strength training in a great light with regards to adolescents, it is important to make a distinction between general strength training and powerlifting. Many children use strength training to excel at their sport. With powerlifting, strength training is the sport and so pushing boundaries in the weight room is likely much more common among powerlifters than it other athletes. As with most competitive pursuits, there is a degree of injury risk associated with it. This does not mean weight training cannot be practiced safely and with benefit among other children.

In fact, a study of 354 middle school and high school football players was conducted with the intent of finding rates of injury due to resistance training programs (Risser, Risser, Preston). The study found a rate of .082 injuries per person per year. Like with the powerlifting group, the lower back was the location of the most prevalent injuries. However, the overall rates of injury are clearly significantly lower among this group than the powerlifters. Because their primary sport is football, it seems probable that these athletes don't push themselves in the weight room as much as powerlifters. This would end up in less form breakdown and then less injuries overall. They also likely use maximal weights significantly less often than the powerlifting group. This is because the powerlifting group needs to show maximal strength through the squat, bench and deadlift.

The football players do not need to show their strength in the form of a one rep max, but rather on the playing field.

While the past two studies have looked at the injury rates among adolescents in strength training programs, they have not examined potential long-term effects (good or bad) that strength training can provide to adolescents. A review in 2006 looked to shed light on injury rates and the effects on growth in adolescents in a variety of training programs (Malina). Injury rates were .176, .053, and .055 per 100 hours in each of the respective programs. Despite the face that it is commonly accepted the weight training from a young age can stunt children's growth to a significant degree, among the participants, strength training was not shown to impact their growth in any way.

In addition to not having a long-term effect on height, there have been studies to examine the long-term positive effects of strength training as well. A study in 2000 looked at the effects of strength training and its effect on sports performance and injuries maintained in sports (Faigenbaum). The research showed an increase in sport performance elicited from a strength training program. Stronger athletes were shown to be able to learn complex movements more effectively. The research also indicated that a strength training program may reduce the rate of sport-related injuries while maximizing athletic performance. This makes intuitive sense to a degree as it seems clear that stronger muscles would be less likely to be injured and more supportive overall of the athletes.

All the studies thus far were performed on young athletes competing in a variety of sports. None of them were done with children with the interest of general health who do not compete in a sport. In 2000, a study was done to examine the role and usefulness of a resistance training program on preadolescent obese children (Sothern et. al.). Nineteen subjects performed a 10 week program that involved diet control and aerobic and flexibility exercises. 48 control subjects participated in the diet control, but walked thrice a week instead of the other parts of the study. Only 15 of the test group completed the 10 weeks and compliance decreased 33% for the long-term portion of the study. The results of the study appear very inconclusive as both the test and control groups experienced significantly reduced fat. Additionally a fair amount of the participants did not complete the full study limiting the sample size. The use of the term "resistance training" comes across as questionable as only flexibility and aerobic exercise is listed. Generally speaking, resistance training refers to free weights and machines. It is unclear if these were utilized in the study. Without knowing if weights were used, it is difficult to put this study into context with the aforementioned research on strength training and its effects. The conclusion of the study suggests using exercise as a method of program adherence, and does not state heavily the usefulness of resistance training as a means to reduce fat. The use of an exercise regimen kept the participants to their diets better than those who did not use an exercise program.

While the current body of research suggests weight training is safe in children, the usefulness of weight training in children remains unclear. There is some evidence suggesting increased athletic performance, but even this seems uncertain and

inconclusive. Going forward research aimed towards further examining the benefits of weight training long term in younger populations could lead to new and useful information. This research should likely be done under the watchful eye of experienced coaches. Further examination of how to lower the risk of injury could also expand the body of knowledge regarding this subject as injuries were shown to be an issue in multiple studies regarding strength training in youths.

Works Cited

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