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THE INFLUENCE OF THE LEVEL OF PHYSICAL ACTIVITY ON THE INDICATORS OF PHYSICAL DEVELOPMENT OF CHILDREN AGED 10 - 14 YEARS

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ABSTRACT

Teenagers aged 10 to 14 are a key stage in children's physical development. During this period, team sports can significantly help in their growth and prepare them for high athletic achievements. It is important to choose the right sport for each child so that they enjoy the activities and maintain motivation for further development. To date, there is a lack of in-depth study of adolescent athlete development, including the potential effects of team sports participation and training load.

KEYWORDS: *Sport, Children, Team Sports, Advantage, Training Load.*

The physical development of children aged 10 to 14 who play team sports goes through a number of changes and developments. Here are some of them: At this age, children continue to grow and develop actively. Bones become stronger and longer, which can give an advantage in team sports that require strength and endurance. Children at this age can develop strength and muscle mass. Regular exercise will help them build stronger muscles and improve their physical endurance. Coordination and balance continue to improve. These are important skills for successful participation in team sports such as football, basketball, or volleyball. Children at this age can develop aerobic endurance, which allows them to maintain a high level of activity for long periods of time. Regular cardio exercise, such as running, swimming, or cycling, can help build endurance. In addition, they can develop their speed and agility, which can be important in team sports that require quick reactions and maneuverability. There is a positive impact on the social and emotional well-being of children. They learn to work in a team, develop leadership skills, make decisions and cope with stress. Regular exercise, proper nutrition and adequate rest play an important role in maintaining the physical development of children involved in team sports. Team sports are usually characterized by frequent repetitions of low to maximum intensity efforts. Therefore, athletes must be able to accumulate large amounts of strength and power to jump, sprint, accelerate, change direction, and perform sudden actions such as kicks and throws. Due to the ever-increasing physical demands of sports, it is important that athletes have well-developed physical indicators to achieve high results in their future sports life.

Therefore, physical performance is highly valued and widely used as selection criteria in the program of the best in team sports. Knowledge of typical trends in the development of physical performance during adolescence is crucial to support adolescent athletes in their long-term development process.

This knowledge will facilitate monitoring and evaluation of adolescent athletes' progress, facilitating the identification of their strengths and weaknesses, optimizing the design of effective training programs, and evaluating training interventions. Understanding the various factors that influence the development process can improve the tailoring of training programs to optimize the development of adolescent athletes. During this period, growth and development are not the primary driving forces for the development of physical performance. Increases in body mass and height, differentiation of fiber types, resting adenosine triphosphate and creatine phosphate levels, increased androgen concentrations, and architectural development of muscle-tendon fibers all contribute to the development of various physical qualities.

Physical activity and sports can affect the hormonal balance of children aged 10 to 14 years. At this age, active physiological changes associated with adolescence occur. One of the main hormones that can be affected is the growth hormone (somatotropin). Physical activity can stimulate the release of growth hormone, which promotes the growth and development of bones and skeletal muscles. Also, intense physical activity can cause changes in the levels of other hormones, such as adrenaline and noradrenaline, which are responsible for the body's adaptation to physical stress. These hormones may increase with high-intensity exercise and help mobilize energy. Estrogen (female sex hormones) and testosterone (male sex hormones) levels may also change in children who engage in physical activity. However, these changes are usually not significant and depend on the individual characteristics of the organism. It is important to note that the impact of physical activity on hormonal balance in children can be complex and depends

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on several factors, including the type and intensity of training, the duration of physical activity, the child's overall health and his or her genetic predisposition.

Despite extensive research on the physical performance of adolescent boys, there is currently no systematic review that comprehensively summarizes the literature on team sport athletes, specifically covering both boys and girls. This knowledge gap is significant given that studies conducted in non-athletic children consistently show marked developmental differences between the sexes during early and late adolescence.

Results from studies among non-athletic children show that boys tend to show greater improvement in physical performance during adolescence, while girls often achieve their best performance soon after puberty; typically between the ages of 13 and 15. These differences may be explained, among other things, by the longer and more powerful developmental and maturational processes that affect the physical development of boys. However, it remains unclear whether these patterns hold true for athletes involved in team sports. If team sport athletes follow similar developmental trajectories, their natural development may slow down in late adolescence.

Therefore, the primary objective of this systematic review was to examine the development of physical performance during adolescence in both male and female team sport athletes.

All data were analyzed using descriptive statistics and presented as yearly differences between age groups. The following tests for each physical characteristic were selected for analysis because they are the most commonly used:
• Sprint: 10 and 30 m.
• Vertical jump: jump against the direction of movement.
• Intermittent Endurance; YYIR tests are a simple method of testing an athlete's ability to perform repeated high-intensity exercise and a multi-stage 20m test.
• Ability to change direction: agility - shuttle run 10 x 5 m and shuttle run 5 x 10 m.
• Upper body strength: grip.
• Lower body strength: the large variety of lower body strength tests in the included studies led to the need to include several different tests.

Interestingly, although non-athletic girls typically show a decline in maximal exercise oxygen consumption rate (VO2 max) around age 14–15, one study found that intermittent endurance performance continues to improve until age 16, just as in boys. This is consistent with the observations made by Tonnessen et al. [2015], who reported improvements in girls' 800m athletics performance even before the age of 18.

A recent study by Landgraff demonstrated developmental differences between oxygen consumption rate and endurance performance during adolescence, where there was an improvement in performance but no change in maximal oxygen consumption rate achieved during exercise (VO2-max).

Given that the multi-stage tests analyzed in this review are performance-based (ie, dependent on multiple physical measures), this may help explain the observed difference between VO2-max development in non-athlete children and endurance athletes in this review. This means that performance is influenced not only by VO2-max, but also by other factors, such as specific muscle adaptations that may be more responsive to training.

This review found gradual improvement in most physical performance indicators during adolescence in both girls and boys in team sports, largely dependent on growth and development. Development is stable and rapid in early adolescence, but appears to slow in late adolescence. Girls develop more slowly than boys, which may be explained by differences in maturation between the sexes, with boys benefiting more from greater increases in testosterone and limb length. Although the groups in this review were structured by chronological age, examining development based on biological age could add interesting information to better understand the role of maturation in the physical development of adolescent athletes. Future research is encouraged to include maturity measures to provide a more accurate understanding of the impact of changes in the evolution of physical performance in team sport athletes. Because research on the impact of training load and team sport participation on long-term physical development is limited, it is difficult to definitively establish their impact during this period.

To improve our understanding of this topic, future studies should include different measures of training load when examining changes in physical performance in adolescent team sport athletes.

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