Study on the Influence of Sports Factors on the Growth and Development of Athletes' Height

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Abstract. In this study, literature, expert interviews, mathematical statistics and bone age assessment methods were used to study 2,347 athletes participating in the 2017 youth sports competitions in Jiangxi province. The results show that sports training has a significant effect on the bone age of young athletes, and precocity of bones is easy to occur. The effect was not significant in early childhood, but significant in adolescence.

The Research Object

Subjects: in 2017, 2347 athletes from Jiangxi province participated in various sports competitions. The main sports categories are gymnastics, diving, tennis, martial arts, swimming, table tennis, badminton, sanda, weightlifting, wrestling, rowing, boxing, athletics, taekwondo, canoeing.

Research Methods

Literature Method

Through Chinese hownet (http://dlib.cnki.net/kns50/) to "growth" as the keyword search, consult relevant sports outstanding masters of human movement science papers, articles related to “growth,” which Dr. 2 papers, 4 master's theses; there are 73 research papers related to "growth and development." At the same time, I read a large number of books related to growth in the school library, and understood the research status, main research results, existing problems and development trends of adolescent growth and development, which provided reliable theoretical and practical basis for the smooth implementation of the experimental scheme of this paper.

Expert Interview

Through the interviews with the experts and teachers in the school, I have a deep understanding of the current research status of growth and development at home and abroad.

Mathematical Statistics

After the end of the experiment, the data of the bone age of the young athletes were sorted out, and SPSS17.0 was used for statistical analysis to obtain relevant experimental analysis data.

Measurement Method of 4 Bone Ages

Methods of bone age assessment in our country mainly adopts the CHN evaluation methods, this method is mainly through X-ray on his left wrist take X line piece, of the growing degree of the evaluation of 14 pieces of bone. Namely: the radius of 1, 3, 5 metacarpal, nearly phalanx in section 1, 3, 5, 3, 5 finger, section 1, 3, 5 far phalanx, magnum, hook bone. The radius is classified into 10 grades, the cephalic bone into 7 grades, and the remaining 12 bones into 8 grades. Each bone has a different score for different grades, so add up the scores of the 14 bones and look them up to determine the age of the bones. Form the main check by the China people carpal bone growth standards-the 05, the standard approved in 2006 by the state administration of inspection and quarantine supervision into the catalog of the industry standard of the People's Republic of China,
the whole shooting process is carried out in accordance with the standard medical procedures, and shooting and read are done by professionals.

Experimental Results and Analysis

Comparative Analysis of Bone Age of Juvenile Athletes in Jiangxi Province

The influence of sports on the growth and development of height and bone age of 2,347 athletes in 15 individual competitions in Jiangxi province in 2017 was analyzed. In order to prevent the influence of extreme data on the overall results, the data with actual age and bone age difference of more than 2 years old (excluding 2 years old) were excluded. 30 people were excluded from the group under 12 years old, and 251 people were excluded from the group over 12 years old. The final statistical data was 2,066 samples.

The Overall Results of the Difference in Actual Age and Bone Age of Youth Athletes in Jiangxi Province. The difference between actual age and bone age of youth athletes in Jiangxi province was analyzed by using the formula: difference = bone age-actual age. According to the data, the average data of the young athletes are positive, indicating that the result of exercise led to the phenomenon of bone precocity. In the group over 12 years old, there was a significant difference in the effect of sports on bone age of male and female athletes, and the degree of bone age precocity of male athletes was significantly higher than that of female athletes (P < 0.05). In the group under 12 years old, there was no significant difference in the effect of sports on bone age of male and female athletes (P > 0.05). All male and female athletes were compared regardless of age, and the results showed that the degree of bone age precocity in male athletes was significantly higher than that in female athletes (P < 0.001). The single sample T test was performed on the data of each group, and the test value was selected as 0 for the difference test. The results showed that in the group over 12 years old, all male and female athletes in the group were significantly higher than 0, indicating that sports produced significant precocious puberty for both male and female athletes. However, there was no significant change in the group under 12 years old, that is, exercise had no significant effect on bone age in the group under 12 years old.

The Effect of Different Sports Events on Bone Age of Juvenile Athletes in Jiangxi Province.

Bone ages of all athletes in different sports were analyzed to explore the effects of different sports on bone ages. Diving, swimming, wrestling; three projects bone age difference is negative, the rest of the project are caused by bone age difference between the average is positive, using T test, single sample inspection value for 0, judgement and overall average 0 if there is a significant difference, the result shows: the gymnastics, martial arts, swimming, table tennis, wushu, wrestling; six projects there is no significant difference, although bone age difference presents the positive and negative levels, but there was no significant change. Diving is the only sport with significant difference and the mean value is negative, indicating that diving makes the bone age of young athletes mature late. Tennis, badminton, weightlifting, rowing, boxing, track and field, and taekwondo had a significant effect on the bone age difference, and showed that the bone age of young athletes precocious phenomenon.

Exercise on bone age affect present different characteristics, different age groups teenagers in under the age of 12 groups of different sports for young athletes of bone age produced different effects and diving project significance to make young athletes mature, bone age and badminton, tennis, weight lifting, three projects significantly precocious young athletes bone age; However, in the group over 12 years old, sports events had a consistent effect on bone age, making the bone age of young athletes premature, among which all sports except tennis, martial arts and wrestling had significant changes.

Discussion and Analysis on the Effect of Sports on Bone Age of Juvenile Athletes in Jiangxi Province

Does Sports Training Affect Bone Growth and Development? The bone ages of all athletes in 2017 youth competition in Jiangxi province were analyzed to explore the effect of sports on the
bone development of teenagers. From 2 and 4.2.2 test results can be seen, on bone growth and development of teenager sports does have an effect, for all the athletes' bone age compared with the actual age, 74% of the athletes present bone age is greater than the actual age, with 22% of movement presents the bone age less than actual age, 4% of athletes' bone age and actual age is the same. The overall result shows that the influence of sports on the young athletes is that sports tend to lead to early bone development and precocity of bones. However, the study of exercise in adolescents by age group showed that exercise had different characteristics on bone growth and development. Under the age of 12 groups of results show that the movement of adolescent athletes appear differentiation, variation of action between project appear polarization, diving project obviously make teenagers mature, bone badminton, tennis, weight lifting, three projects of significance to make young athletes bone age precocious, several other projects not significant effects on bone growth and development. The height growth of children under 12 years old is in a relatively uniform growth period, and the growth rate is relatively slow. Therefore, sports have a relatively small impact on the bone growth and development of children. However, in the group over 12 years old, the bone growth rate was accelerated due to the fact that the age was just in the period of puberty. All the sports events accelerated the growth and development of the juvenile motor bones, and the bones appeared the phenomenon of early maturation. This result maintained the same conclusion with the result of 4.1, that is, in the age of 3-12 years, the bone is in the stage of slow development, and the influence of sports on the bone growth and development is relatively small. The results of sports training on bone growth and development of adolescent athletes over 12 years old are consistent with the results of Li Zhigang's (2000) study that long-term sports training will accelerate the bone growth rate, leading to the phenomenon of early puberty.

From sports to the male, the female adolescent athletes bone age effect to compare the results of the study showed that under the age of 12 categories, male, female athletes bone age change there is no significant difference, and in group over 12 years of age, male, female athletes bone age changes exist significant differences, male athletes early maturity level significantly higher than female athletes. The results indicated that a characteristic, because men, girls, and exercise capacity difference is opposite bigger, male athletes relative exercise often greater than the female athlete, suggests that the greater the degree of sports training, the greater the amount of exercise, the bone age early maturity degree is, the more obvious, the results also can well reflect the size effect on bone growth and development. However, in the group under 12 years old, the differences in athletic ability and training intensity between male and female athletes are relatively small, so there is no significant difference in bone growth and development between male and female athletes.

Do Different Sports Have Different Effects on Bone Growth and Development? It is an important question to be solved in this study whether different forms of exercise affect the growth and development of height. Therefore, the investigation of bone growth and development of athletes in different sports has become an important part of this study.

In surface results from the data of bone growth and development of each sports impact on business performance of the opposite sex, the different sports as test factors, the bone age and actual age difference for variables, single factor variance analysis, the results F = 9.481, P < 0.001, suggesting that the sport of bone age difference has the extremely significant difference effect. From impact on bone age difference significant project classification, found that in more than 12 years old group overall characteristics, to physically demanding sport is the most significant effect on bone age, skills as the main sports affect bone age is relatively small, but there are also individual sports failed to well present the above this view, such as table tennis is given priority to with skills of project in high effect of the impact of bone age difference, and the movement of sanda, wrestling directly against the class project has appeared in the low effect of group, the cause of this result may be due to sports training level factors, The interview with experts from Jiangxi sports science research institute found that the level of young athletes is uneven, although some teams registered for the competition, but some members of the training time is very short, only for the total score of the team and the addition of players. This part of the data will skew the results of the data. According to the features of the results, the sports press with high fitness sports skills test class
sports grouped again, can be seen from the results of bone age and skilled sports physical sports reflect obvious influence on male athletes, saw no difference in female athletes has changed, the results and the analysis conclusion is relatively consistent, means of physical exercise on bone age of puberty has a more significant role. However, from the distribution characteristics of the samples, although many athletes are engaged in physical exercise training, their bone age still shows the characteristics of late maturity, indicating that the intensity of exercise training is large, which is easy to cause bone precocity, but it is also appropriate for people, not all individuals will produce precocity when carrying out large amount of exercise training.

**Conclusion and Looking**

**Conclusion**

Sports training has a significant effect on the bone age of young athletes, which is easy to make the bones appear precocious. The effect was not significant in early childhood, but significant in adolescence.

**Looking**

Through this study found that the movement of height growth can produce effect, although the impact is limited, but still present a larger individual differences, indicates that the influence degree of the motion of individual travel will show the opposite sex, not all individuals have positive role on the stimulation of movement, this is what reason cause has yet to be further discussed. Therefore, the research on this aspect can be further studied.

**References**


